

Table 4.1: CCR VERSUS CAMA				
FACTOR	N.C. CAMA Coal Ash Management Act of 2014. Law on 8/20/2014	EPA CCR RULE Final on 12/19/2014 and Effective on 10/06/2016	CAMA Amendments Law on 7/14/2016	Water Infrastructure Improvements for the Nation (WIIN) Act of 2016. Law on 12/16/2016.
1. APPLICABILITY	All ash basins, landfills, and beneficial reuses. Focus is on basin closure.	Surface impoundments, landfills, and inactive surface impoundments that impound water at stations with generation. Beneficial uses. Regulates CCR disposal.	Deletes references to Coal Ash Management Commission. Review of DEQ's quarterly reports left to Environmental Review Commission.	Establishes a state permit program for coal ash impoundments to be supervised by the U.S. Environmental Protection Agency. Amends the Resource Conservation and Recovery Act (RCRA), changing the EPA's self-implementing coal ash rule into an EPA-authorized state permit program. The EPA will only approve of the state programs if they incorporate already-established federal requirements.
2. BASIN CLOSURE	Required timing is based on risk rankings or "High Priority" designation.	Required if basins cannot meet various safety and environmental criteria. High priority is placed on stability evaluation.		
3. BASIN EVALUATION	All basins must close. Subjective risk ranking determines closure method. Ash basins to be risk-ranked by NCDEQ based on 9 factors in CAMA. CAMC reviews and approves risk rankings.	Basins can remain operating. Demonstrations that basins meet all Dam Safety, Liner, Groundwater, and Location restrictions must be made within 18 to 42 months of rule publication. Basins must be closed if demonstrations can't be made.	§ 130A-309.213. Prioritization of coal combustion residuals surface impoundments. Deletes specific criteria under (a) to be evaluated by DEQ in assessing surface impoundment risk. (d)(1) requires the DEQ to a low risk classification if it (a) Has established permanent water supplies as required for the impoundment pursuant to G.S. 130A-309.211(c1) and (b) Has rectified any deficiencies identified by, and otherwise complied with the requirements of, any dam safety order issued by the Environmental Management Commission for the impoundment pursuant to G.S. 143-215.32. (c) Other impoundments are classified as intermediate risk. § 130A-309.216. Ash beneficiation projects (new)	
4. CLOSURE METHOD	Cap in place allowed for "low risk" basins only. Clean closure via excavation required for "high priority", "high risk", and "intermediate risk" impoundments.	Cap in place and clean closure allowed. Requirements for each method is provided.		
5. CLOSURE TIMING	Closure timing is tied to risk ratings: 5, 10, or 15 years.	Forced closures within 5 years with possible extensions for certain factors (i.e., no alternate capacity available, size of impoundment). Up to 15.5 years in some cases.		
6. CONVERSION TO DRY ASH DISPOSAL	Requires dry fly ash disposal by Dec 2018 and dry bottom ash disposal by Dec 2019.	Does not expressly address conversion to dry ash disposal. However, in some cases, conversion is driven by basin closure requirements. EPA extended timelines to accommodate Steam Electric Effluent Limitations Guidelines that proposes to require conversion to dry ash disposal.		
7. ENFORCEMENT	State regulatory agency with Coal Ash Management Committee oversight. Enforcement through state agency action.	Self-implementing. Enforced through citizen suits in federal court.		TITLE II--WATER AND WASTE ACT OF 2016 Subtitle C--Control of Coal Combustion Residuals. (Sec. 2301) This bill amends the subtitle D (Resource Conservation and Recovery Act of 1976) of the Solid Waste Disposal Act to establish a permit program for coal combustion residuals (coal ash) that states, after approval by the EPA, may elect to administer in lieu of a federal regulatory program. The EPA must review the programs at least once every 12 years, or on the request of a state. The EPA may use specified authorities to enforce the prohibition against open dumping with respect to a coal combustion residual unit.

8. GROUNDWATER MONITORING	Groundwater assessment required 180 days after DEQ's approval of the plan (pending??). Monitoring done at compliance boundary. Measuring for 15A NCAC 02L.0202 criteria (limit in parentheses). In Items IV.134-185 of the Plea Agreement, Duke acknowledged that water from seeps may transport pollutants such as aluminum (NL), arsenic (10 µg/L), barium (700 µg/L), boron (700 µg/L), cadmium (2 µg/L), chloride (250 mg/L), chromium (100 µg/L), copper (1 mg/L), fluoride (2 mg/L), iron (300 µg/L), lead (15 µg/L), manganese (50 µg/L), nickel (100 µg/L), selenium (20 µg/L), sulfate (250 mg/L), thallium (NL), zinc (1 mg/L), and TDS (NL).	Required within 30 months of rule publication (DATE). Monitoring done at waste boundary. Measuring for statistically significant increases over background (CONSTITUENTS AND LEVELS).	Review of DEQ's quarterly reports left to Environmental Review Commission. § 130A-309.211. Groundwater assessment and corrective action; drinking water supply well survey and provision of alternate water supply; reporting. New (c1) requires no later than October 15, 2018, the owner of a coal combustion residuals surface impoundment shall establish permanent replacement water supplies for (i) each household that has a drinking water supply well located within a one-half mile radius from the established compliance boundary of a coal combustion residuals impoundment, and is not separated from the impoundment by the mainstem of a river, as that term is defined under G.S. 143-215.22G, or other body of water that would prevent the migration of contaminants through groundwater from the impoundment to a well and (ii) each household that has a drinking water supply well that is located in an area in which contamination resulting from constituents associated with the presence of a coal combustion residuals impoundment is expected to migrate.	
9. STRUCTURAL FILLS	Governed as beneficial reuse solution with specific permitting and construction criteria (SPECIFY). CAMA regulated structural fills >8,000 tpy or 80,000 tons per project. Small structural fills <8,000 tons per acre or 80,000 tons per project are deemed permitted. Large SF >8,000 tons per acre or 80,000 tons per project require liners, caps, leachate control, groundwater monitoring, and financial assurance. NC CCP rule will add requirements to make as stringent as EPA CCR.	Must qualify as beneficial reuse under the rule or meet the requirements for a CCR landfill. EPA CCR requires reporting and environmental demonstrations for fills >12,400 tons.		
10. BENEFICIAL USE OF CCP	Draft of State CCP rule to be consistent with CAMA, coordinated with NCDOT and UNC Charlotte, and go to EMC in July 2016. NCDEQ will incorporate into current DWM and DWR beneficial use/reuse rules.			
11. COMPREHENSIVE SITE ASSESSMENTS (CSA) AND CORRECTIVE ACTION PLANS (CAP)	CSA and CAP containing over 1,000 pages each were submitted by Duke to NCDEQ. Largest investigation of its kind was completed over six months. Duke drilled over 870 wells and collected over 7,000 samples. However, this extensive work could not determine the horizontal and vertical extent of contamination or background levels of constituents critical to prioritization. DEQ is unable to determine with current (12/31/15) data is Duke coal as ponds are impacting wells but there are known impacts at Sutton and Asheville. In 476 wells sampled, DHHS issued do not drink notices for 424 wells mainly for vanadium and hexavalent chromium BUT only 12 wells exceeded SDWA levels (7 for lead and 5 for arsenic) which could be attributed to poor well construction (lead) or naturally occurring (arsenic).			
12. DECANTING AND DEWATERING	On August 28, 2014, NCDEQ authorized decanting to begin under existing NPDES permits. Complete dewatering requires NPDES permit modification but is necessary for wet ash removal and must address engineered and non-engineered seeps. NPDES permits are on hold for 13 of 14 Duke facilities.	On September 10, 2014, EPA ordered NC decanting halted. On December 14, 2015, EPA authorized NC to resume decanting but is still unsure on permitting seeps that may be "waters of the US" -- a problem at 894 US impoundments. EPA appears to be backing away from written Hanlon Policy.		
13. GROUNDWATER AND DRINKING WATER STANDARDS	NC DHHS has the lowest groundwater standard (10 ppb) in the US but issues do not drink notices for 0.07 ppb for Cr(VI) and 0.03 ppb for Vanadium. More than 70% of the US public water supplies exceed DHHS screening levels for Cr(VI) or Vanadium.	Federal SWDA standard is 100 ppb Total Chromium and has no standard for Vanadium.		

Table 4.2: CCR State Rules and Regs

FACTOR	Kentucky	West Virginia	Virginia	Tennessee	Georgia	South Carolina
1. APPLICABILITY	401 KAR 4:070. Applicability established by EPA CCR rule.	W.VA.REGS. 33-1-5. Adopts federal regulations.	9 VAC 20-60-261. Adopted federal regulations. Senate Bill 1533 from January 2019 requires CCR be removed for recycling or deposition in a lined landfill.	TN Rule 0400-11-01-.02	GA Rule 391-3-11. Adopts federal regulations.	SC Code Regs 61-79.261 establishes regulations for CCR impoundments as exempt from solid waste designation.
2. BASIN CLOSURE	401 KAR 4:070. Closure procedure established by EPA CCR rule	W.VA.REGS. 33-1-5. Adopts federal regulations.	9 VAC 20-60-261. Adopted federal regulations. In January 2019 Senate Bill 1533 requires that any CCR unit located in the Chesapeake Bay watershed be closed by recycling/beneficial use or deposition in a permitted and lined landfill.		GA Rule 391-3-11. Adopts federal regulations.	
3. BASIN EVALUATION		W.VA.REGS. 33-1-5. Adopts federal regulations.	Senate Bill 1398 required every owner/operator of CCR impoundments to conduct an assessment regarding closure of the unit, no later than December 1, 2017.	TDEC Order OGC15-0177 (to TVA). TVA shall conduct an investigation of CCR disposal areas listed in the order, to collect groundwater and other environmental data.		
4. CLOSURE METHOD	401 KAR 4:070. Closure procedure established by EPA CCR rule	W.VA.REGS. 33-1-5. Adopts federal regulations.	Senate Bill 1398 requires every owner/operator of CCR impoundments to conduct an assessment regarding closure of the unit, no later than December 1, 2017. January 2019's Senate Bill 1533 requires recycling or removal to a lined landfill.	Cap in place allowed. The TDEC order to the TVA requires a corrective action risk assessment plan that includes the methods TVA will employ to remove and/or close in place CCR material at the sites.		
5. CLOSURE TIMING	401 KAR 4:070. Closure procedure established by EPA CCR rule	W.VA.REGS. 33-1-5. Adopts federal regulations.	Senate Bill 1398 required every owner/operator of CCR impoundments to conduct an assessment regarding closure of the unit, no later than December 1, 2017. Senate Bill 1533 requires closure projects to be complete within 15 years of their initiation.			
6. CONVERSION TO DRY ASH DISPOSAL						
7. ENFORCEMENT	401 KAR 46:120. Permits given by state regulatory agency.	W.VA.REGS. 33-1-5. Adopts federal regulations.	9 VAC 20-60-261. Adopted federal regulations.			

8. GROUNDWATER MONITORING	401 KAR 46:110. Groundwater monitoring and corrective action are established in the EPA CCR rule.	W.VA.REGS. 33-1-5. Adopts federal regulations.	9 VAC 20-60-261. Adopts federal regulations. Senate Bill 1533 requires closure projects to be accompanied by water testing for every residence within one-half mile.	TDEC Order OGC15-0177 calls for plans to address groundwater monitoring for the future of the CCR impoundment	GA Rule 391-3-11. Adopts federal regulations.	
9. STRUCTURAL FILLS				TN Rule 0400-11-01-.02. Disposal is limited to coal ash in engineered structures for highway overpasses, levees, runways, or foundation backfill.	Not specifically authorized under Georgia law or regulations	Not specifically authorized under SC law or regulations. Regulations were drafted in 1994 by SCDHEC but were withdrawn.
10. BENEFICIAL USE OF CCP		CCRs may be reused as material in manufacturing another product or as a substitute for a natural resource, for the extraction of recovery materials and compounds contained within the CCRs, as a stabilization/solidification agent for other wastes, under the authority of the WVDoE, as pipe bedding, as antiskid material, as a construction base for roads or parking lots. W.VA.REGS. 33-1-5.5.b.4.A-H	Senate Bill 1533 requires that any owner of a CCR unit explain why recycling is not economically feasible if they choose to landfill the CCR instead.			
11. COMPREHENSIVE SITE ASSESSMENTS (CSA) AND CORRECTIVE ACTION PLANS (CAP)						
12. DECANTING AND DEWATERING						
13. GROUNDWATER AND DRINKING WATER STANDARDS	401 KAR 46:110. Groundwater monitoring and corrective action are established in the EPA CCR rule.	W.VA.REGS. 33-1-5. Adopts federal regulations.	9 VAC 20-60-261. Adopted federal regulations. Senate Bill 1522 in January 2019 required closure projects to be accompanied by water testing or a connection to municipal water for every residence within one-half mile.		GA Rule 391-3-11. Adopts federal regulations.	

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THE DISPOSAL AND RECLAMATION OF SOUTHWESTERN COAL
AND URANIUM WASTES

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1.0 INTRODUCTION

One of the major environmental problems confronting the coal and uranium industries of the Southwest is the disposal and reclamation of the large volumes of wastes produced by mining, processing, and on-site utilization of these resources. Wastes and drainages are produced during coal mining and cleaning, and the burning of coal in modern boilers produces large quantities of ash and sludge. Likewise, uranium mining and milling generates large amounts of solid and liquid waste materials. The wastes from both of these industries must be carefully deposited in waste disposal sites, and reclamation measures taken to ensure their long term stability. In this paper, the types of wastes produced by the coal and uranium industries in the Southwest will be described, some of the potential environmental impacts from these materials will be considered, and the procedures in current use for the disposal and reclamation of these wastes will be discussed.

2.0 DISPOSAL AND RECLAMATION OF COAL WASTES

Coal is a type of combustible rock that is formed from plant remains and various inorganic components. Because of this, coal is a highly heterogeneous material that contains a wide variety of rock and mineral impurities in addition to the carbon-like matrix. Most of the environmental contamination and waste materials produced by coals are a direct consequences of these impurities.

In each step of the coal processing cycle, from mine to eventual utilization, various wastes or effluents are produced that must be treated, stored, or disposed of (Fig. 1.). These for the most part are high volume wastes that have the potential for causing great environmental damage if not properly handled. The coal industry of the Southwest is still in its infancy, but dramatic increases in the use of coal from the region (with the accompanying necessity to devote greater attention and resources to waste disposal and reclamation) will be necessary if our nation is to decrease its dependence on foreign energy sources and meet future energy needs.

2.1 COAL MINING WASTES

Coal is removed from the earth by two principal kinds of mining: strip mining and underground mining. In the Southwest, strip mining is the dominant form of coal extraction because most of the coal now being mined in this region is deposited relatively close to the surface.¹ In the strip mining of coal, heavy equipment such as power shovels, bulldozers, trucks, and draglines are used to remove the overburden and expose the coal seam, and remove the coal from the mine pit. In the past, many strip mines were simply abandoned with little or no effort to reclaim them after the accessible coal had been removed, but with the passage of the federal Surface Mining Control and Reclamation Act (1977) such practices are no longer allowable. Strip mine reclamation has become an integral part of the mining operation.

The surface mining act specifies that all surface soil must be carefully removed during mine development and stored so that it can be used later during reclamation. The remaining overburden must also be stored for reuse. As the coal is removed from the ground, the overburden is

progressively backfilled into the previously mined areas. When the mining operation is completed the remaining overburden is put into the mine, the top soil is replaced, and native ground cover is reestablished.

Although adherence to the federal strip mine act eliminates the necessity to separately dispose of solid mine wastes, the problem of ground water contamination or disruption during or subsequent to mining remains a bothersome problem without an easy solution. Much of the strip-able coal in the southwestern region lies above major aquifers, but for that which does not, diversion and pumping of water from mining sites must be done. After mining is completed, it is very difficult to restore the condition of the original aquifers. Western coals and coal spoils are far less likely to produce contaminated drainages when ground water passes through them than are eastern coals;² however, it would be a recommended practice to monitor the groundwater downfield from recently reclaimed mining areas to assure that undesirable contaminants are not being released.

In the underground mining of coal, access shafts are sunk vertically into the coal seam or mine shafts are bored directly into coal outcroppings; from these access points mine tunnels are distributed into the coal seam. Conventional room and pillar mining is most often practiced in the underground mining of coal; however, some highly mechanized forms of mining, such as long-wall mining, are becoming more popular where conditions permit their use.³

The underground mining of coal produces a large amount of spoil or mineral wastes. These are the overburden and rock removed from the mine shafts while gaining access to the coal seams, and the rock intrusions in the seams themselves. It has not yet proven feasible to replace underground mine spoils back into the mine, so these wastes must be discarded at the surface. The usual practice for disposing and reclaiming western

mine spoils is to place them into a depression or gully, where they can be compacted and graded to prevent erosion and perhaps seeded with native vegetation.⁴ Nearby strip mines also provide a convenient place for the disposal of underground mine spoils.

One of the most serious environmental problems associated with the underground mining of southwestern coals is the possible disruption and degradation of aquifers located in the coal seam or associated strata. There are no effective remedial measures for restoring the original aquifer drainage once mining has disrupted it. Therefore, the best means of avoiding aquifer damage during underground coal mining is to preplan the mining operation with as much knowledge as possible of the geohydrology of the area.

2.2 COAL CLEANING WASTES

Coal, as mined, contains a great deal of extraneous rock and mineral matter. These constituents usually comprise about 10% to 20% of raw coals, but they can run as high as 50% for some coals.⁵ The rock and mineral matter is expensive to ship, and it dilutes the energy content of the coal, but, of most importance from an environmental viewpoint, these impurities produce undesirable gaseous and particulate pollutants when the coal is burned. Therefore, about one-half of the total coal mined in the United States is prepared or cleaned prior to utilization to remove some of the noncombustible materials. Currently little western coal is washed or cleaned before combustion, but the demand for higher quality coal will undoubtedly result in a higher proportion of these coals being cleaned in the future.

Coal cleaning is largely a mechanical process, involving a series of crushing, sizing, separating and drying steps. In most cases, the coal is separated from the mineral matter on the basis of density. Modern coal

preparation plants can recover about 90% of the energy content of the coal, while reducing the mineral content of the coal considerably.⁶

The wastes produced by coal cleaning are similar in composition to the spoil materials produced by coal mining. However, because cleaning wastes are more finely divided than mine wastes, they present a greater problem with regard to disposal and reclamation. The drainages from cleaning waste disposal sites are often contaminated with dissolved and suspended solids.⁷ Also, because they contain some residual coal, cleaning waste dumps frequently catch fire; and, because of the poor structural quality of coal cleaning wastes, disposal areas for these materials often exhibit structural instabilities.⁷

The disposal and reclamation of coal cleaning wastes is governed by the Federal Coal Mine Health and Safety Act of 1969. Site choice and preparation methods are clearly defined by the act. Basically, the act specifies that coal cleaning wastes are to be discarded on an impermeable layer of clay, crushed refuse, or some other suitable material, and that successive additions of waste be compacted as they are added to the dump. Erosion stability of a completed refuse disposal area is provided by grading, followed by the addition of clay, top soil, or some other sealant. Although precautions are to be taken to direct surface and ground waters away from the disposal site, any water that does pass through the site must be impounded and treated, if necessary.

2.3 COAL COMBUSTION WASTES

The burning of coal, and the use of pollution control devices such as scrubbers and precipitators, produces large volumes of solid waste materials that need to be disposed of in environmentally compatible ways. The bulk of the residue is bottom ash formed by the nonvolatile mineral matter in

the coal, and fly ash, which is a fine particulate material removed from the boiler effluents by precipitators or scrubbers. More than 60 million tons of bottom ash, fly ash and scrubber sludge are produced annually in the United States from coal combustion.⁸ There is growing awareness that the discarded wastes from coal combustion are a serious potential source of surface and ground water contamination.

There is not yet federal legislation specifically addressing the disposal and reclamation of the various forms of coal combustion wastes. However, both the Federal Water Pollution Control Act (FWPCA) and The Resource Conservation and Recovery Act (RCRA) apply to coal combustion wastes, and, in effect, dictate to some extent how these wastes can be disposed.

Land filling and ponding are the two most prevalent methods for disposing of coal combustion wastes.⁹ Land disposal sites for ash include gullies, natural depressions, excavated areas, and depleted strip mines. One disadvantage of using land fill methods for disposing of coal ash in the southwestern region is that considerable maintenance is needed to reduce ash losses from the dump by the winds that frequent the area.

Much of the ash produced by coal combustion is discharged into ash ponds. With increasing frequency fly ash and scrubber sludge are being discharged into the same pond.⁹ In these ponds the solids are allowed to settle, and the water is decanted off into holding ponds or recycled for process use.

About 4×10^3 acre-ft of land are required for the disposal of the 5×10^6 tons of ash that accumulate in the lifetime of a 1000 MWe coal-fired power plant.⁹ If scrubber sludge is also ponded in the same area, land requirements increase disproportionately due to the relatively large volume occupied by the sludge/ash mixtures.⁹

The reclamation of ash and sludge ponds is tricky business due to high amounts of residual water that these wastes retain. Often it is necessary

to add cement, thickeners or stabilizing agents to the dried solids before reclamation can proceed.^{9,10} Frequently stabilizing agents are added directly to the sludges before ponding, thus alleviating the need to rework the material during reclamation. The final stages of ash and sludge pond reclamation include compacting the dried stabilized solids, adding top soil and establishing vegetation to reduce surface erodibility.

The control of contaminated leachates and seepages from disposal ponds for fly ash and scrubber sludge represents, perhaps, the most significant environmental problem facing the southwestern coal and utilities industries. Many trace contaminants that are present in the fly ash or sludge can be mobilized by the waters present in the ponds.^{9,10} The transport of contaminants from the disposal ponds into shallow or deep aquifers could result in degradation of the quality of these waters. Frequently, ash and sludge disposal areas are lined with impermeable materials to reduce the loss of water from them.^{9,10} Nonetheless, careful monitoring of the surface and subsurface effluents from disposal ponds is a necessity in any well planned disposal and reclamation scheme for coal combustion wastes.

3.0 DISPOSAL AND RECLAMATION OF URANIUM MINING AND MILLING WASTES

In addition to coal, the southwestern region of the United States is blessed with an abundance of uranium ore. In fact, about 50% of our current national production of uranium concentrate comes from the San Juan Basin.¹¹ The uranium contents of the ores of the region are quite low (usually about 0.2%)¹² hence, a relatively large volume of waste material is produced by the uranium mining and milling industries compared to most other primary minerals extraction processes.

Precluding the possible disposal of reactor wastes in southwestern sites, the major types of wastes and effluents produced by the uranium industry in the region are depicted in Fig. 2. There are many analogies between the disposal and reclamation of coal mine and combustion wastes and uranium mining and milling

wastes; however, the mobile radioactive and nonradioactive components in many uranium wastes pose a far greater potential for environmental harm than do most coal wastes, dictating that much more care and judgement be exercised in disposing of uranium industry wastes.

3.1 URANIUM MINING WASTES

There are three forms of mining practiced by the uranium industry: open pit, underground, and in situ leach mining. Most of the uranium ore in the Southwest is extracted either by underground or open pit mining.¹³ Nationally, about 2% of the total uranium concentrate produced results from in situ leach mining, although this form of mining is likely to become more prevalent as dwindling resources force the exploitation of lower grade ores.

Underground mining of uranium ore produces many of the same types of waste materials as does the mining of coal. These include both mine spoils and mine drainage. Mine wastes (rock and soil) are generated while gaining access to the ore bearing strata, and associated rock and lower grade ores are removed as waste during the development of the mine. Often groundwater intrudes into the mining area and mine dewatering is required. The volumes of water pumped from active underground uranium mines vary between 20 and 4000 gal/min.¹⁴ The quality of these water discharges is variable, but sometimes treatment may be needed to reduce contaminant levels, or contaminated water is ponded and evaporated.

The solid wastes or spoils produced by underground mining of uranium ore is usually discarded in convenient nearby disposal sites. Uranium mine spoils and ores are generally not considered to be highly hazardous materials; however, there are documented instances where the contaminated drainages from surface accumulations of these materials have caused severe environmental damage to plants and animals.¹⁵

Mine water from underground uranium mines is usually pumped into surface drainage channels or into evaporation ponds. Some mine water is also used as process water for mining and milling operations. Where the volumes of water involved are very large, care must be exercised in disposing of them. Seepage from mine water holding ponds can pass through tailings or mine spoil disposal sites, picking up contaminants from these sources, and transporting these contaminants into the environment.

In some parts of the Grants Mineral Belt, mine dewatering has been shown to result in degradation to the quality of aquifers in the area.¹⁶ This was due to the acute drawdown of the aquifer volume and subsequent increases in the salt contents of the water. Such consequences of mine dewatering activities may dictate in the future that mine waters be re-injected back into the strata in which they originated.

Open pit mining of uranium ore is practiced where the ore deposits are located relatively near the surface, usually at depths of less than 500 ft.¹⁷ In a fashion similar to coal mining, overburden is removed with front end loaders, and scrapers. Additional spoils are produced during the mining operation when low grade ores are discarded or stored, or additional overburden must be removed to expose ore pockets. Water encountered during the open pit mining of uranium is either diverted away from the mining site or is pumped to the surface and released or impounded. Here too, aquifer disruption and loss of ground water quality are difficult problems to circumvent.

There are no federal laws pertaining specifically to mine spoils or reclamation following either the strip or underground mining of uranium ore. The recently enacted Uranium Mill Tailings Radiation Control Act (UMTCA) does instruct EPA and NRC to report to Congress by 1980 concerning the locations and potential environmental hazards of uranium mine wastes, along with recommendations to eliminate these hazards. For the time

being FWPCA and RCRA provide the major guidelines for the disposal and reclamation of these wastes. Reclamation practices for both underground and open pit mine wastes produced by uranium extraction are similar to those employed for coal mine wastes.

In many instances, it is not practical to mine certain uranium ores, due to the inaccessibility of the deposits or to the low quality of the ore. Such deposits may instead be exploited by in situ leaching techniques.¹⁸ In situ leach mining involves the pumping of chemical leach solutions into the ore deposit through an injection well, forcing the leachate through the ore to dissolve or mobilize the uranium compounds, and collecting the pregnant leach solutions at a series of recovery wells. The uranium-bearing solutions are then processed at the surface to recover the uranium.

In situ leach mining is advantageous in that it produces very small amounts of waste materials or aqueous effluents to be disposed and reclaimed. However, these apparent advantages may be more than offset by the environmental problems caused by the escape of the chemical leach solutions into subsurface water systems. Unfortunately, even the best efforts at geologic mapping cannot result in the total assurance that a leach mining site is hydrologically isolated from its surroundings.

3.2 URANIUM MILLING WASTES

Uranium milling is the process in which crushed and powdered uranium ores are subjected to a series of chemical leaching and extraction steps to remove the minute amount of uranium from the ore. These chemical processing steps partially break down the structure of the ore matrix, thereby releasing the uranium contained within. As mentioned earlier, more than 99% of the contents of the uranium ore are eventually discarded as mill wastes. One very important consequence of the milling operation is that it also

mobilizes other potentially harmful components in the ore (such as toxic trace elements or other radioactive substances) that are released as wastes in tailings disposal sites. In addition mill tailings also contain small amounts of chemicals and solvents used in the milling processes.

Tailings are discharged from uranium mills in the form of aqueous slurries. Typical mill tailings slurries contain water, sand, silt and various slimes. The slurries are pumped into impoundments where the solids settle out and the remaining water is decanted into evaporating ponds, or is recycled back into the mill. However, seepage or overflow from tailings ponds or holding ponds often escapes into the environment. When this happens there is the strong likelihood that these waters will carry undesirable quantities of radioactive and nonradioactive contaminants with them.^{19,20}

Until recently the legal basis for regulating the disposal and reclamation of uranium mill wastes was quite confusing. NRC (or individual states in agreement with NRC) held licensing authority over active tailings disposal operations, but this authority terminated when the license was withdrawn at the cessation of the mill operation. The responsibility for inactive tailing disposal areas was left piecemeal up to the individual states. In late 1978, Congress passed UMTCA, which directs that NRC provide licensing authority over both active and inactive mill tailings disposal sites. EPA is charged by the act with developing standards for tailings areas, and DOE is responsible for the development of control and reclamation methods for both active and inactive disposal areas.

Environmentally, mill tailings disposal sites are particularly troublesome because they can be the source of both atmospheric and water-borne contaminants.^{19,20} Radon, a radioactive gas, is produced by radioactive

decay within the tailings materials, and may be emitted to the atmosphere if precautions are not taken to seal the surface of the tailing pile.¹⁹ In addition, as alluded to earlier, the large volumes of contaminated water in or near tailings dump sites can seep or discharge into surface or ground-water systems. Thus, the disposal and reclamations of uranium mill tailings must provide for the containment of radon gas, the containment of aqueous solutions, and long-term resistance to erosion.

Past practices, where mill tailings were discarded without much regard to environmental consequences, are no longer acceptable. Although the details of current mill tailings disposal and reclamation strategies will depend both on the nature of the disposal site and the volume of the materials involved, several key components will be present in each.²⁰ In the future, mill tailings will more than likely be deposited into impoundments or settling ponds that are lined with an impermeable layer of rock, clay or other stable material. Frequently, stabilizing and floccing agents will be used to more efficiently promote dewatering, and to assure the stability of the dried tailing solids. All waste water will be recycled, evaporated or treated prior to release. Upon completion of a disposal site, the entire site will be capped with another impermeable layer of clay, asphalt or concrete to retain radon and promote stability. Finally, the capping agent may be covered with soil and plant growth reestablished.

4.0 SUMMARY

The types of solid wastes and effluents produced by the southwestern coal and uranium mining and milling industries were considered, and the current methods for the disposal and reclamation of these materials were discussed. The major means of disposing of the solid wastes from both industries is by land fill or in some

instances ponding. Sludges or aqueous wastes are normally discharged into settling and evaporative ponds. Basic reclamation measures for nearly all coal and uranium waste disposal sites include solids stabilization, compacting, grading, soil preparation and revegetation. Impermeable liners and caps are beginning to be applied to disposal sites for some of the more harmful coal and uranium waste materials.

5.0 REFERENCES

1. Keystone Coal Industry Manual, Nielsen, G. F., Ed., McGraw-Hill Inc., New York, 1978, p. 666.
2. Dettmann, E. H., and Olsen, R. D., "Assessment of Water Quality Impacts of a Western Coal Mine," Chapter 4 in The Reclamation of Disturbed Arid Lands, Wright, R. A., Ed., University of New Mexico Press, Albuquerque, NM, 1977.
3. Lindbergh, K. and Provorse, B., Coal: A Contemporary Energy Story," McGraw-Hill Inc., New York, 1977, p. 72.
4. Aldon, E. F., "Reclamation of Coal Mined Land in the Southwest," J. Soil and Water Cons., 33, No. 2, 75, (1978).
5. Wewerka, E. M., Williams, J. M., and Vanderborgh, N. E., "Disposal of Coal Preparation Wastes: Environmental Considerations," Proceedings of the Fourth National Conference on Energy and the Environment, Theodore, L. et.al. Ed., American Institute of Chemical Engineers, Dayton, OH, 1976, p. 226.
6. Reference 5, p. 227.
7. Wewerka, E. M., Williams, J. M., Wanek, P. L., and Olsen, J. D., "Environmental Contamination From Trace Elements in Coal Preparation Wastes: A Literature Review and Assessment," EPA-600/776007, August 1976, pp. 1-5.
8. "Environmental Control Implications of Generating Electric Power From Coal," Technology Status Report, Vol. II, Argonne National Laboratory, ANL/Ect-1, 1976, p. 171.
9. Reference 8, pp. 167-202.
10. Phillips, N. P., and Wells, R. M., "Solid Waste Disposal," Final Report, Radian Corp., pB-233, 144, NTIS, May, 1974, pp. 163-184.
11. "Statistical Data of the Uranium Industry," United States Energy Research and Development Administration, GJO-100(77), 1977, pp. 30, 31.
12. Reference 11, p. 47.

13. "An Overview of the New Mexico Uranium Industry," New Mexico Energy and Minerals Department, Santa Fe, NM, April, 1979, p. 18.
14. Reference 13, pp. 72-74.
15. Dollahite, J. W., et.al., "Copper Deficiency and Molybdenosis Intoxication Associated With Grazing Near a Uranium Mine," The Southwest Veterinarian, 47, Fall, (1972).
16. Kaufmann, R. F., Eadie, G. G., and Russel, R. R., "Effects of Uranium Mining and Milling on Ground Water in the Grants Mineral Belt, New Mexico," Ground Water, 14, No. 5, 296 (1976).
17. "Uranium Industry in New Mexico," New Mexico Energy Institute, The University of New Mexico, Report No. 76-100B, Albuquerque, NM, 1976, p. 87.
18. Larson, W. C., "Uranium in Situ Leach Mining in the United States," United States Department of the Interior, Bureau of Mines Information Circular 8777, 1973.
19. Reference 13, pp. 125-132.
20. Dreesen, D. R., Marple, M. L., and Kelley, N. E. "Contaminant Transport, Revegetation and Trace Element Studies at Inactive Uranium Mill Tailings Piles," Proceedings of the Symposium on Uranium Tailings Disposal, Colorado State University, Nov. 20-21, 1978.
21. "Draft Generic Environmental Impact Statement on Uranium Milling," Vols. I and II, U.S. Nuclear Regulatory Commission, NUREG-0511, April 1979.

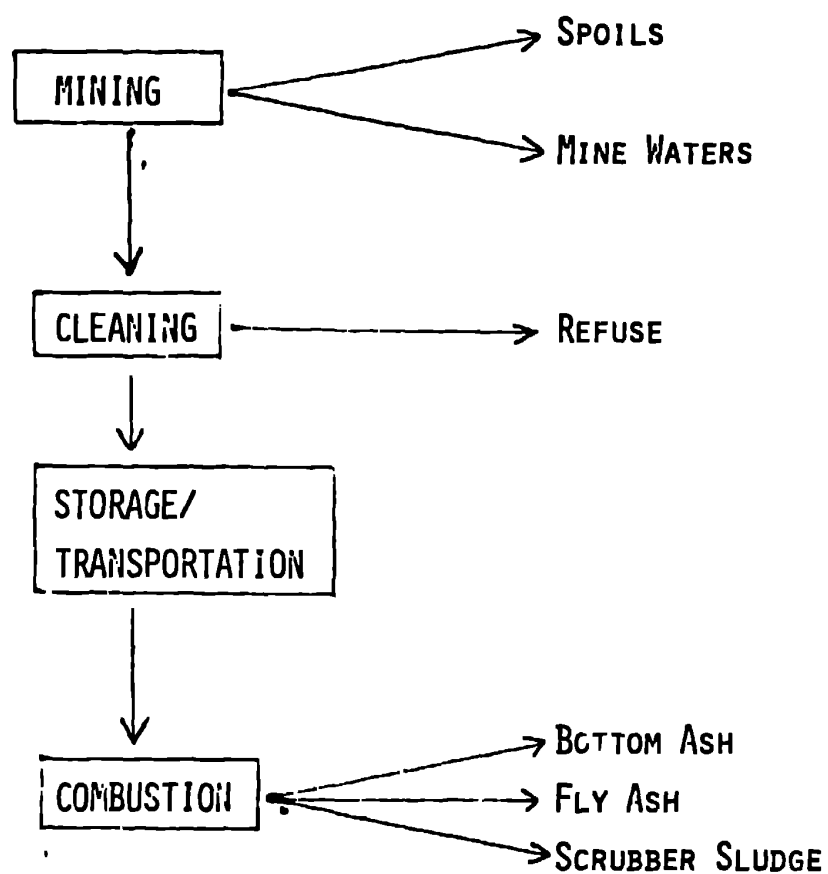


Fig. 1. Wastes produced by coal mining and combustion.

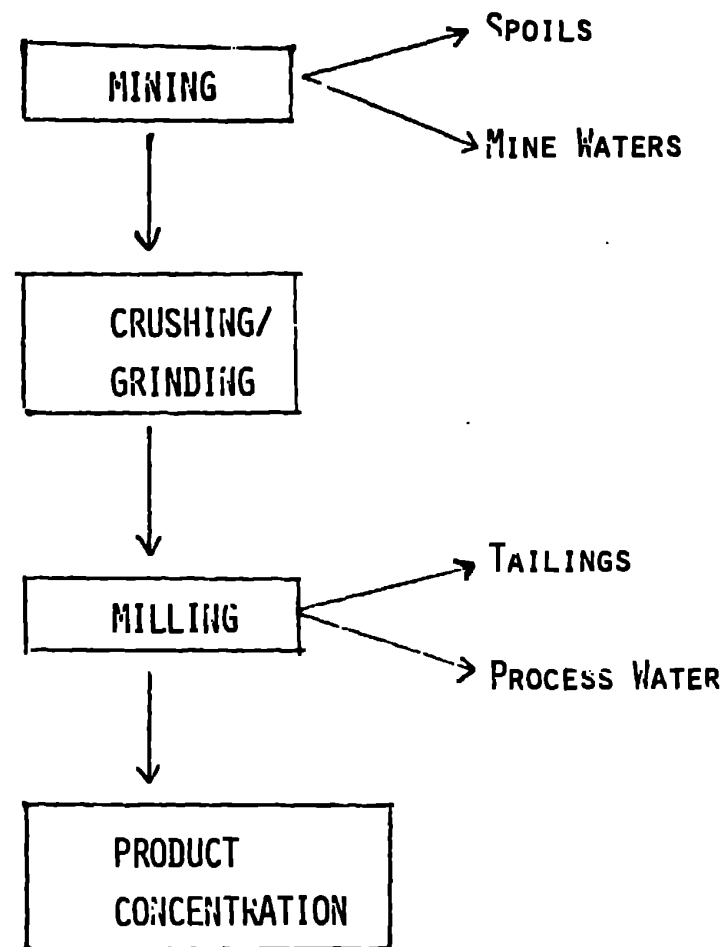


Fig. 2. Wastes produced by uranium mining and milling.

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
WESTERN DIVISION
No. 5:15-CR-67-H-2
No. 5:15-CR-68-H-2

FILED IN OPEN COURT
ON 5/14/15
Julie Richards Johnson, Clerk
US District Court
Eastern District of NC

UNITED STATES OF AMERICA)
)
 v.) MEMORANDUM OF PLEA AGREEMENT
)
DUKE ENERGY CAROLINAS, LLC)

Pursuant to Rule 11(c)(1)(C) of the Federal Rules of Criminal Procedure, the United States of America, by and through the United States Attorneys for the Eastern District of North Carolina, the Middle District of North Carolina, and the Western District of North Carolina as well as the Environmental Crimes Section of the United States Department of Justice (collectively referred to herein as "the United States" or "the Government"), and the Defendant, DUKE ENERGY CAROLINAS, LLC (referred to herein as "the Defendant" or "DUKE ENERGY CAROLINAS") with the advice and concurrence of the Defendant's counsel, Julia S. Janson (Executive Vice-President, Secretary, and Chief Legal Officer, Duke Energy Carolinas, LLC) and James P. Cooney, III (Womble Carlyle Sandridge & Rice LLP) have agreed that the above-captioned case should be concluded in accordance with this Memorandum of Plea Agreement as follows:

1. This Memorandum constitutes the full and complete record of the Plea Agreement for criminal conduct in each of the prosecuting districts, that is, the Eastern District, Middle District, and Western District of North Carolina and as alleged in the following charging documents (hereinafter referred to collectively as the "Criminal Informations"):

United States v. Duke Energy Business Services LLC, and Duke Energy Progress, Inc., No. 5:15-CR-62-H;

United States v. Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc., No. 5:15-CR-67-H; and

United States v. Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc., No. 5:15-CR-68-H.

There are no other agreements between the parties in addition to or different from the terms herein.

2. The United States and the Defendant agree:

- a. That this Plea Agreement ("Agreement") is made pursuant to Rule 11(c)(1)(C) of the Federal Rules of Criminal Procedure ("Fed. R. Crim. P.") and that the sentence set forth herein is the appropriate disposition of this case. If the Court rejects this Agreement, it is further agreed that the Defendant may withdraw its plea and all of the parties may withdraw from this Agreement.
- b. The parties further acknowledge that based upon the Joint Factual Statement, a copy of which is attached hereto as Exhibit A, the Court has sufficient information in the record to enable it to meaningfully exercise its sentencing authority. Accordingly, if acceptable to the Court, the parties agree to waive the presentence investigation and report pursuant to Fed. R. Crim. P. 32(c), and to request that the Defendant be sentenced at the time the guilty plea is entered.
- c. The parties further agree and acknowledge that the Defendant's parent corporation, Duke Energy Corporation, shall guarantee all monetary penalties (criminal fine, restitution, community service, and mitigation) imposed upon the Defendant and the funding and performance due from the Defendant in connection with the nationwide and statewide environmental compliance plans under this Agreement as more fully set forth in the Guaranty Agreement, a copy of which is attached hereto at Exhibit B (without attachments) and fully incorporated herein by reference. The parties further agree and acknowledge that Duke Energy Corporation shall consent to the jurisdiction of the United States District Court for the Eastern District of North Carolina for the purpose of enforcing the Guaranty Agreement.
- d. Pursuant to Fed. R. Crim. P. 11(c)(1)(C), the parties agree that the following sentence is warranted in this case:

- i. Criminal Fines: At the time of imposition of sentencing, the Defendant shall make a payment of Criminal Fines totaling \$53.6 million (\$53,600,000) as follows:

Dan River Violations

- (1) \$38 million (\$38,000,000) for the negligent Clean Water Act discharge without a National Pollutant Discharge Elimination System ("NPDES") permit from the 48-inch stormwater pipe at Dan River Steam Station based upon a fine of twice the gross gain or loss pursuant to 33 U.S.C. § 1319(c)(1)(A) and 18 U.S.C. § 3571(c) and (d).
- (2) \$2 million (\$2,000,000) for the negligent Clean Water Act failure to maintain the coal ash impoundments and related appurtenances (48-inch stormwater pipe) as required by the applicable NPDES permit for the Dan River Steam Station, a fine within the statutory penalty range of \$2,500 to \$25,000 per day of violation pursuant to 33 U.S.C. § 1319(c)(1)(A) and 18 U.S.C. § 3571(c) and (d).
- (3) \$9.5 million (\$9,500,000) for the negligent Clean Water Act discharge without a NPDES permit from the 36-inch stormwater pipe at Dan River Steam Station, a fine within the statutory penalty range of \$2,500 to \$25,000 per day of violation pursuant to 33 U.S.C. § 1319(c)(1)(A) and 18 U.S.C. § 3571(c) and (d).
- (4) \$2 million (\$2,000,000) for negligent Clean Water Act failure to maintain the coal ash impoundments and related appurtenances (36-inch stormwater pipe) as required by the applicable NPDES permit for the Dan River Steam Station, a fine within the statutory penalty range of \$2,500 to \$25,000 per day of violation pursuant to 33 U.S.C. § 1319(c)(1)(A) and 18 U.S.C. § 3571(c) and (d).

Riverbend Violations

- (5) \$2.1 million (\$2,100,000) for the negligent Clean Water Act discharge in violation of the applicable NPDES permit at Riverbend Steam Station, a fine within the statutory penalty range of \$2,500 to \$25,000 per day of violation pursuant to 33 U.S.C. § 1319(c)(1)(A) and 18 U.S.C. § 3571(c) and (d).
- ii. Probation: A statutory-maximum term of five (5) years of probation is warranted. 18 U.S.C. § 3561(c)(2). Probation shall include the standard conditions of probation and the following special conditions, pursuant to 18 U.S.C. § 3563(a) and (b):
- (1) Compliance with the Law: The Defendant shall not commit another federal, state, or local crime during the term of probation.
- (2) Cooperation with Probation Office: The Defendant shall fully cooperate with the United States Probation Office. The Defendant shall answer truthfully all inquiries by the Probation Officer; shall provide full access to any of the Defendant's operating locations; shall give ten (10) days' prior notice of any intended change in principal business or mail address; and shall provide notice of any material change in the Defendant's economic circumstances that might affect the Defendant's ability to pay the fines and other financial obligations set forth herein.
- (3) Nationwide Environmental Compliance Plan: Under the terms of its plea agreement, co-defendant Duke Energy Business Services LLC ("DEBS") is required to develop, adopt, implement, and fund a comprehensive nationwide environmental compliance plan ("NECP") during its term of probation, consistent with sentencing policies set forth in USSG §8D1.4 and which incorporates

all of the agreed-upon obligations set forth in Paragraph 3(u)(v) of this Agreement. The Defendant shall take all steps necessary or required to assist DEBS in meeting this obligation.

- (4) Statewide Environmental Compliance Plan: The Defendant, along with its co-defendants Duke Energy Progress, Inc. ("DEP") and DEBS, shall develop, adopt, implement, and fund a comprehensive statewide environmental compliance plan ("ECP-NC") during its term of probation, consistent with sentencing policies set forth in USSG §8D1.4 and which incorporates all of the agreed-upon obligations set forth in Paragraph 3(u)(vi) of this Agreement.
- (5) Notice to Employees and Shareholders: Upon approval by the Court of the NECP and ECP-NC, the Defendant shall notify its employees of its criminal behavior, the NECP, and the ECP-NC. In addition, the Defendant shall cause a notice containing the same information to be sent to the shareholders of Duke Energy Corporation. Such notice shall be in a form prescribed by the Court-Appointed Monitor ("CAM") and at a time designated by the CAM.
- (6) Community Service Payment: Pursuant to USSG §8B1.3 and in furtherance of the sentencing principles provided for under 18 U.S.C. § 3553(a), at the time of sentencing, the Defendant shall make a community service payment totaling \$13.5 million (\$13,500,000), through the National Fish and Wildlife Foundation ("NFWF"), to fund environmental projects, studies, and initiatives designed to benefit, preserve, and restore the riparian environment and ecosystems of North Carolina and Virginia affected by the Defendant's conduct, as set forth in Paragraph 3(aa) of this Agreement.
- (7) Mitigation: In order to compensate for impacts to wetlands and other jurisdictional

waters of the United States impacted as a result of the Defendant's conduct, including temporal and secondary effects, at its facilities in North Carolina with coal ash impoundments, the Defendant shall provide \$5 million (\$5,000,000) to an authorized wetlands mitigation bank or conservation trust, approved by the Court, for the purchase of riparian wetland and/or riparian land and/or restoration equivalent located in the Broad River Basin, French Broad River Basin, Cape Fear River Basin, Catawba River Basin, Dan River Basin, Yadkin-Pee Dee River Basin, Neuse River Basin, Lumber River Basin, and Roanoke River Basin as set forth in more detail in Paragraph 3(bb) of this Agreement.

iii. Payment Liability/Financial Assurances: The Defendant shall be liable for and pay all fines, restitution, community service, and mitigation payments and shall fund the NECP and ECP-NC, all as set forth herein. The Defendant shall further be liable for any additional restitution payments as determined by the CAM.

(1) Reservation of Funds by Defendant: The Defendant further shall record appropriate reserves on financial statements for the purpose of recognizing the projected obligation to retire its coal ash impoundments in North Carolina. This obligation is currently estimated at a total of \$2.0 billion (\$2,000,000,000) on the Defendant's balance sheet. Each year during the term of probation, beginning on the date that the Agreement is accepted by the Court and occurring by March 31 of each year thereafter, the Defendant shall cause the Chief Financial Officer of Duke Energy Corporation, as further directed under the Guaranty Agreement attached hereto, to certify to the United States and the CAM that the Defendant and Duke Energy Corporation have sufficient assets reserved to meet the obligations imposed by law or regulation or as may otherwise be necessary

to fulfill the Defendant's obligations with respect to its coal ash impoundments within the State of North Carolina. If the CAM has any concerns regarding the assets available to meet obligations imposed by the Judgment in this case, the CAM shall immediately notify the Court and the parties.

- (2) Reservation of Funds by Parent Company: The Defendant further shall cause its parent holding company, Duke Energy Corporation, to record appropriate reserves on its consolidated financial statements for the purpose of recognizing the projected obligation to retire all coal ash impoundments, including those in North Carolina. This obligation is currently estimated at a total of \$3.4 billion (\$3,400,000,000) on Duke Energy Corporation's balance sheet for all coal ash impoundments (including those owned by the Defendant and co-defendant DEP). Each year during the term of probation, beginning on the date that the Agreement is accepted by the Court and occurring by March 31 of each year thereafter, the Defendant shall cause the Chief Financial Officer of Duke Energy Corporation, as further directed under the Guaranty Agreement attached hereto, to certify to the United States and the CAM that the Defendant and Duke Energy Corporation have sufficient assets reserved to meet the obligations imposed by law or regulation or as may otherwise be necessary to fulfill the Defendant's obligations with respect to its coal ash impoundments within the State of North Carolina. If the CAM has any concerns regarding the assets available to meet obligations imposed by the Judgment in this case, the CAM shall immediately notify the Court and the parties.
- (3) Security: Through the entire term of probation, the Defendant shall further maintain unused borrowing capacity in the amount of \$250 million (\$250,000,000) under the Master Credit Facility as security to

meet its obligations under this Agreement for the closing and remediation of coal ash impoundments, as more fully set forth in Paragraph 3(k) of this Agreement. The Defendant shall certify this set aside to the CAM on an annual basis, or more frequently as the CAM requires. If the CAM has any concerns regarding the security available to meet the obligations imposed by the Judgment in this case, the CAM shall immediately notify the Court and the parties.

- iv. Restitution for Counts of Conviction: Pursuant to 18 U.S.C. §§ 3663, 3663A, and 3563(b)(2), the Defendant shall make restitution to any victim in whatever amount the Court may order. Said restitution shall be due and payable immediately. Said restitution shall include at a minimum, as apportioned to this Defendant pursuant to 18 U.S.C. § 3664(h), restitution to be paid to the Clerk of the Court as follows:

- (1) \$63,309.45 to Virginia Beach, payable to:

City of Virginia Beach
c/o Department of Public Utilities
City of Virginia Beach
2405 Courthouse Drive
Virginia Beach, Virginia 23456
ATTN: **"Coal Ash Spill - Water Quality
Sampling / CIP 5-967" as a reference**

- (2) \$125,069.75 to City of Chesapeake, VA (Lake Gaston sampling costs) payable to:

City of Chesapeake
c/o David Jurgens,
Director of Public Utilities
306 Cedar Rd, 2nd floor
Chesapeake, VA 23322

- (3) and \$31,491.11 to the United States Army Corps of Engineers payable to:

FAO-USACE Wilmington
c/o Anita Bisette
69 Darlington Ave
Wilmington, NC 28406
(910-251-4803)

- v. Restitution for Relevant Conduct to Be Paid During Term of Probation: Pursuant to 18 U.S.C. § 3663, the Defendant shall pay restitution as directed by the CAM through the claims process set forth in Paragraphs 3(x)(iii)-(vi) of this Agreement.
- vi. Special Assessment: The Defendant shall pay special assessments, totaling \$625.00, before or at the time of sentencing, and shall provide a receipt from the Clerk of Court for the Eastern District of North Carolina to the United States as proof of payment.
- vii. Public Apology: Consistent with USSG §8D1.4(a), the Defendant and co-defendants DEBS and DEP shall place a full-page public apology in at least two national newspapers and three major North Carolina newspapers (one in Raleigh, one in Greensboro, and one in Charlotte) and on its publicly accessible company website.

3. The Defendant agrees:

- a. Consent to Transfers: To consent to the entry of Rule 20 transfers for purposes of guilty pleas to the charges in the following matters:
 - i. United States v. Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc., No. 1:15-CR-51-1 (MDNC); and
 - ii. United States v. Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc., No. 3:15-CR-43-FDW (WDNC).
- b. Restitution for Counts of Conviction: Pursuant to 18 U.S.C. §§ 3663, 3663A, and 3563(b)(2), to make restitution as ordered by the Court and as set forth in this Agreement. Said restitution shall be due and payable immediately. Said restitution shall include

additional costs associated with the Dan River response as previously set forth in Paragraph 2(d)(iv) of this Agreement.

- c. Restitution for Relevant Conduct to be Paid During Term of Probation: In addition to any order of restitution in connection with the counts of conviction, to make restitution to the following entities, as determined and directed by the CAM during the term of probation and pursuant to the agreed-upon claims process set forth in Paragraphs 3(x)(iii)-(vi):
- i. City of Eden, North Carolina; Town of Madison, North Carolina; and other localities impacted by bromide discharges from the Belews Creek and Cliffside facilities
 - (1) For all costs, whenever incurred, associated with water treatment system upgrades resulting from the increase of trihalomethanes including, but not limited to, maintenance costs.
 - (2) All costs associated with investigating and responding to increased discharges of bromide and/or the increase of trihalomethanes.
 - ii. Other Local Governments with drinking water treatment systems impacted by bromide discharges from other facilities owned by the Defendant
 - (1) For all costs, whenever incurred, associated with water treatment system upgrades resulting from the increase of trihalomethanes including, but not limited to, maintenance costs.
 - (2) All costs associated with investigating and responding to increased discharges of bromide and/or the increase of trihalomethanes.
- d. Crime Victims' Rights Act: Except as provided herein, at the time of the execution of this Agreement, the parties are not aware of any other

victim as that term is defined by 18 U.S.C. §§ 3663, 3663A, and 3771. The Defendant understands that the United States intends to fully comply with all obligations under 18 U.S.C. § 3771, including victim notification and restitution provisions.

- e. Appeal Waiver: To waive knowingly and expressly the right to appeal the conviction and whatever sentence is imposed on any ground, including any appeal pursuant to 18 U.S.C. § 3742, and further to waive any right to contest the conviction or the sentence in any post-conviction proceeding, including any proceeding under 28 U.S.C. § 2255, excepting an appeal or motion based upon grounds of ineffective assistance of counsel or prosecutorial misconduct not known to the Defendant at the time of the Defendant's guilty plea. The foregoing appeal waiver does not constitute or trigger a waiver by the United States of any of its rights to appeal provided by law.
- f. Waiver of Rights to Records: To waive all rights, whether asserted directly or through a representative, to request or receive from the United States any records pertaining to the investigation or prosecution of this matter, except as provided in the Fed. R. Crim. P. This waiver includes, but is not limited to, rights conferred by the Freedom of Information Act and the Privacy Act of 1974.
- g. Special Assessment: To pay a special assessment of \$125.00 for each misdemeanor count pursuant to the provisions of 18 U.S.C. § 3013. The assessment shall be paid by the Defendant at sentencing. The Defendant or Defendant's counsel shall provide a check in payment of the said assessment directly to the Clerk of Court, U.S. District Court-EDNC.
- h. Financial Statement: To complete and submit a financial statement under oath to the United States no later than two weeks prior to the entry of the guilty plea. The Defendant can satisfy this condition by submitting its most recent financial statement filed with the Securities and Exchange Commission.
- i. Reservation of Funds by Defendant: To record appropriate reserves on financial statements for the

purpose of recognizing the projected obligation to retire its coal ash impoundments in North Carolina, and, during each year during the term of probation, to certify that it has sufficient assets reserved to meet the obligations imposed by law and regulation as more fully set forth in Paragraph 2(d)(iii)(1) above. This obligation is currently estimated at a total of \$2.0 billion (\$2,000,000,000) on the Defendant's balance sheet.

- j. Reservation of Funds by Parent Company: To cause its parent holding company, Duke Energy Corporation, to record appropriate reserves on its consolidated financial statements for the purpose of recognizing the projected obligation to retire all coal ash impoundments, including those in North Carolina, and during each year during the term of probation, to cause its parent holding company to certify that it has sufficient assets reserved to meet the obligations imposed by law and regulation as more fully set forth in Paragraph 2(d)(iii)(2) above. This obligation is currently estimated at a total of \$3.4 billion (\$3,400,000,000) on Duke Energy Corporation's balance sheet for all coal ash impoundments (including those owned by the Defendant and co-defendant DEP).
- k. Security: Through the entire term of probation, to maintain unused borrowing capacity in the amount of \$250 million (\$250,000,000) under the Master Credit Facility as security to meet its obligations under this Agreement for the closing and remediation of coal ash impoundments, as more fully set forth in Paragraph 2(d)(iii)(3) of this Agreement. A copy of the certification for 2015 shall be filed with the Court at the time of entry of this Agreement.
- l. Cooperation: The Defendant shall continue to cooperate fully with the United States, and with all other authorities and agencies designated by the United States, and shall truthfully disclose all information with respect to the activities of the Defendant and its present and former directors, officers, employees, agents, consultants, contractors, and subcontractors thereof, regarding the conduct underlying the Criminal Informations about which the Defendant has any knowledge or about

which the United States shall inquire. This obligation of truthful disclosure includes the obligation of the Defendant to provide to the United States, upon request, any document, record, or other tangible evidence regarding the conduct underlying the Criminal Informations about which the United States shall inquire of the Defendant. Compliance with such cooperation requirements shall not be construed as requiring or effecting a waiver of the attorney-client privilege or work product protections.

- m. Such cooperation set forth in Paragraph (l) above shall include but not be limited to: (a) promptly disclosing any and all related criminal or potentially criminal conduct of which the Defendant is currently aware; (b) promptly producing all documents requested by the federal government or by grand jury subpoena; (c) promptly making employees available to the investigation team upon request for interview or for testimony in any proceeding, subject to those employees' own legal rights; and (d) making reasonable efforts to ensure its employees provide full and truthful information.
- n. If the Defendant, through its employees acting within the scope of their employment, provides false, incomplete, or misleading information or testimony, or fails to abide by any term of cooperation set forth in Paragraphs (l) and (m) above, this would constitute a material breach of this Agreement by the Defendant, and the Defendant shall be subject to prosecution for any federal criminal violation not barred by the applicable statute of limitations (or as waived pursuant to Paragraph 3(hh)) or other legal prohibition. Any information provided by the Defendant may be used against the Defendant in that prosecution.
- o. Additionally, the Defendant agrees that in the event of the Defendant's material breach of this Agreement the following are admissible against the Defendant in any prosecution of or action against the Defendant: (i) any statements made by the Defendant, under oath, at the guilty plea hearing (before either a Magistrate Judge or a District Judge); (ii) the Joint Factual Statement supporting this Agreement; and

(iii) any evidence derived from such statements. This includes the prosecution of the charges that are the subject of this Agreement or any charges that the United States agreed to dismiss or not file as part of this Agreement, but later pursues because of a material breach by the Defendant. Additionally, the Defendant knowingly and voluntarily waives any argument under the United States Constitution, any statute, Rule 410 of the Federal Rules of Evidence, Fed. R. Crim. P. 11(f) of the Federal Rules of Criminal Procedure, and/or any other federal rule, that the statements or any evidence derived from any statements should be suppressed or are inadmissible.

- p. Compliance with the Law: Except as provided otherwise herein and in Paragraph (q) below, the Defendant agrees that it shall commit no new violations of federal, state, or local law, including those laws and regulations for which primary enforcement has been delegated to state authorities, and shall conduct its operations in accordance with the environmental laws of the United States and the State of North Carolina. If the Defendant learns of any such violations committed by its agents or employees during the term of probation, the Defendant shall notify the United States of the violations in accordance with the terms of the environmental compliance plans.
- i. The Defendant understands that the Government shall not consider there to be a violation of the conditions of probation if the Defendant complies with federal environmental laws when there is a direct conflict between the state and federal environmental laws.
- q. The Defendant shall comply with all federal, state, and other regulations relating to coal ash, and will have no new notices of violation, notices of deficiency, or other criminal, civil, or administrative enforcement actions based on conduct (including the failure to act) occurring after entry of the guilty plea.
- i. The Defendant understands that it shall be considered a violation of the conditions of probation if the Defendant engages in the above

conduct and such conduct or condition results in a final assessment (after conclusion of any appeals) in an amount greater than \$5,000 and imposed after the entry of the guilty plea and which the CAM deems material. Any conduct or conditions resulting in a final assessment in an amount greater than \$15,000 shall be presumed to be material.

- ii. It shall not be considered a violation of probation if the enforcement action is based upon information disclosed by the Defendant in its 2014 Topographic Map and Discharge Assessment Plan(s) and/or its 2014 NDPES permit renewal application(s) for its facilities in North Carolina.
- r. The Defendant shall comply with all legislative and regulatory mandates concerning closure of the coal ash impoundments which it operates, and shall complete full excavation and closure of all of the coal ash impoundments at its Dan River and Riverbend facilities in accordance with federal and state laws, including the United States Environmental Protection Agency's ("EPA") 2014 final rule governing the disposal of coal combustion residuals from electric utilities ("CCR Rule") and North Carolina's Coal Ash Management Act of 2014, by the dates dictated in those laws, currently the calendar year 2019. In so doing, the Defendant shall act diligently and in good faith to meet projected critical milestones in its closure plans for each site as set forth in the following documents: Duke Energy's Dan River Steam Station Coal Ash Excavation Plan dated November 13, 2014; and Duke Energy's Riverbend Steam Station Coal Ash Excavation Plan dated November 13, 2014 (collectively referred to as "Excavation Plans"), as may be amended with the approval of the North Carolina Department of Environment and Natural Resources ("DENR").
- i. With respect to excavated coal ash, the removed ash shall be stored in a lined CCR landfill space or lined impoundment meeting all requirements established by applicable statute, law, and regulation, including but not limited to 40 CFR Part 258 (Subtitle D of RCRA). Nothing in this Paragraph shall prohibit the Defendant from the

disposition of ash through beneficial reuse as contemplated by the CCR Rule.

- ii. Every six months, or on a more frequent basis as determined by the CAM, the Defendant shall provide the CAM with a detailed description of its efforts to excavate coal ash and close all of the coal ash impoundments at Dan River and Riverbend and whether it has met the critical milestones set forth in the Excavation Plans in the time period since the last report. The Defendant shall also include the status of all permits and permit applications with any regulatory body, including but not limited to DENR. The Defendant shall also make such reports publicly available on its website.
 - (1) If the CAM has any concerns regarding whether the Defendant acted diligently or in good faith to meet its obligations under this provision, including the critical milestones set forth in the Excavation Plans, the CAM shall immediately notify the Court and the parties.
- iii. The Defendant shall contemporaneously provide an executive summary of the report in subparagraph (ii) above to the United States Attorneys' Offices for the Eastern, Middle, and Western Districts of North Carolina; the Department of Justice - Environmental Crimes Section; the United States Environmental Protection Agency - Criminal Investigation Division; and the United States Environmental Protection Agency - Legal Counsel Division. Upon request, the Defendant shall provide the full report for inspection and review by any of the governmental parties.
 - (1) If the Government has any concerns regarding whether the Defendant acted diligently or in good faith to meet its obligation under this provision, including the critical milestones set forth in the Excavation Plans, the Government may elect to notify either the CAM or the Court, and may seek additional penalties as may be appropriate.

- iv. Six months prior to the end of the term of probation, the Defendant shall provide the Court, the CAM, and the Government with a full report of its efforts to excavate coal ash and to close all of the coal ash impoundments at Dan River and Riverbend and the anticipated completion date.
- v. The Government may seek additional fines and penalties should the Defendant fail to comply with such legislative or regulatory mandates and closure requirements under this Paragraph unless the compliance is delayed by a "force majeure" as that term is defined herein. The parties recognize that a change in law making performance impossible may be raised under the "force majeure" clause herein, but final determination shall be made by the Court.
- vi. The Defendant understands that the Government shall not consider there to be a violation of the conditions of probation if the Defendant complies with federal environmental laws when there is a direct conflict between the state and federal environmental laws. The Defendant, however, shall immediately notify the Court, the CAM, and the Government of the conflict of laws and the impact on excavation and closure plans.
- s. Criminal Fine: The Defendant shall pay a total criminal fine in the amount of \$53.6 million (\$53,600,000), allocated as set forth in Paragraph 2(d)(i) above.
- t. Stipulated Factual Basis for Fine: The Defendant stipulates that there is a factual basis for the imposition of a criminal fine in the amount of \$53.6 million (\$53,600,000) pursuant to 33 U.S.C. §§ 1319(c)(1)(A) and/or 18 U.S.C. § 3571(c) and (d) and that the payments made pursuant to Paragraph 2(d)(i) do not together exceed the statutory maximum fine available under each of the applicable statutes. The Defendant further waives any right to a jury or bench trial as to those payments.
- u. Environmental Compliance Plans: As a special condition of probation, the Defendant shall cause, assist, and otherwise take all steps necessary to

effectuate the obligation of co-defendant DEBS to develop, adopt, implement, and fund the NECP designed to ensure compliance with applicable environmental laws and regulations at all of the coal ash impoundments owned and operated (whether active or inactive) by any wholly-owned subsidiary of Duke Energy Corporation. In addition to requirements to be applied nationwide, the Defendant, along with co-defendants DEBS and DEP, shall develop, implement, and enforce the ECP-NC that also incorporates all of the requirements of the NECP. Both the NECP and the ECP-NC shall be filed with the Court as separate documents. Components of the NECP and the ECP-NC include, but are not limited to, the following:

- i. Timing for Submission of NECP and ECP-NC: Defendant DUKE ENERGY CAROLINAS, along with its co-defendants DEBS and DEP, shall develop and adopt the NECP and ECP-NC within seventy (70) days of the selection of the CAM. The final NECP and ECP-NC shall be submitted to the Court with copies to the United States Probation Office; the United States Attorneys' Offices for the Eastern, Middle, and Western Districts; the Department of Justice - Environmental Crimes Section; the Environmental Protection Agency - Criminal Investigation Division; and the United States Environmental Protection Agency - Legal Counsel Division. The Court must approve both the NECP and ECP-NC.
 - (1) The United States acknowledges that two (2) wholly-owned subsidiaries of Duke Energy Corporation, Duke Energy Commercial Enterprises, Inc. (an indirect wholly-owned subsidiary) and Duke Energy SAM, LLC (a direct wholly-owned subsidiary) have entered into a purchase and sale agreement with a subsidiary of Dynegy Inc. in which Dynegy Inc. will acquire Duke Energy Ohio's unregulated Midwest generation business (which has been classified as Discontinued Operations on the Condensed Consolidated Statement of Operations). Approval is pending before the Federal Energy Regulatory Commission. Both of the subsidiaries handle coal ash.

- (2) If the sale above has not been closed at the time of the submission of the NECP to the Court for approval, it is expressly understood and agreed that these assets need not be included within the NECP with the following exception: if the sale is not closed within ninety (90) days of the approval of the NECP by the Court, the CAM may, at his/her option, require the NECP to be amended to include these subsidiaries.
- ii. Best Efforts: Defendant DUKE ENERGY CAROLINAS, along with its co-defendants DEBS and DEP, shall use best efforts to comply with each and all of the obligations under both the NECP and ECP-NC.
- (1) The requirement that the Defendant exercise "best efforts" to fulfill the obligation includes using commercially reasonable efforts to anticipate any potential "force majeure" event (as defined herein at Paragraph 3(y)) and to address the effects of any potential "force majeure" event: (a) as it is occurring, and (b) following the potential "force majeure" event, such that the delay is minimized to the greatest extent possible.
 - (2) If the CAM believes that the Defendant has not used "best efforts" to fulfill its obligations, the CAM shall provide written notice immediately to the Court and the parties.
 - (3) The final determination of whether the Defendant used "best efforts" shall be made by the Court with the advice of and recommendations from the CAM.
 - (4) If the Court concludes that the Defendant failed to exercise "best efforts" to fulfill an obligation of this Agreement, the Court may impose and the Government will be entitled to seek additional monetary penalties.

iii. Selection and Funding of CAM:

- (1) Funding: As part of the NECP and the ECP-NC, Defendant DUKE ENERGY CAROLINAS, along with its co-defendants DEBS and DEP, shall pay for a CAM who will be appointed by and report to the Court during the full period of probation.
- (2) Qualifications: The object of the selection process for the CAM is to select the most qualified candidate to oversee implementation of the NECP, the ECP-NC, and the bromide claims process. Therefore, the CAM must have staff, or be able to retain staff, with the following experience: (a) expertise and competence in the regulatory programs under the United States and State of North Carolina environmental laws; (b) sufficient expertise and competence to assess whether the Defendant, DEBS, and DEP have adequate management systems in place to ensure regulatory compliance, document such noncompliance, and prevent future noncompliance; and (c) sufficient expertise and competence to review claims for reimbursement under the process for identifying, verifying, and providing restitution for claims relating to bromide discharges described herein.
- (3) Nomination and Veto by Government: Within thirty (30) days of the entry of the Judgment, Defendant DUKE ENERGY CAROLINAS, along with its co-defendants DEBS and DEP, shall submit a list of three qualified candidates for the position of CAM from which the Court will select and appoint one of the candidates. Any nomination will include a detailed curriculum vitae or similar documentation setting forth the qualifications of the candidate. The Government shall have fifteen (15) days from the receipt of the nominations to file any reasonable objection to any or all of the proposed candidates. If the Government lodges an objection, then Defendant DUKE

ENERGY CAROLINAS, along with its co-defendants DEBS and DEP, must nominate a replacement candidate(s). The Government again shall have the right to lodge any reasonable objection to any replacement candidate; and the Court may adjust the time frame for the nominations of the CAM as necessary to ensure that the best possible candidates are nominated.

- (4) Court Selection: Upon receipt of a final list of candidates, the Court shall select one candidate as CAM by written order. In the event that the Court does not find any of the candidates satisfactory or if, during any point in the term of probation, the Court does not find the work of the selected CAM satisfactory, the Court may request Defendant DUKE ENERGY CAROLINAS, along with its co-defendants DEBS and DEP, to nominate additional candidates. The Court may adjust the time frame for the selection of the CAM as necessary to ensure that the best possible candidate is selected.

iv. Reporting by CAM: On an annual basis, or more often as the Court directs, the CAM shall provide reports in writing to the Court, through the United States Probation Office, demonstrating compliance with the NECP and the ECP-NC by DUKE ENERGY CAROLINAS, DEBS and DEP. The report shall include, among other things, a detailed description of: (1) all excavation, closure, and/or proper remediation of the coal ash impoundments located in North Carolina and addressed in the ECP-NC; and (2) all three co-defendants' compliance with all appropriate environmental laws and regulations in connection with the management of their coal ash impoundments in North Carolina and elsewhere.

- (1) Public Access to Information: The CAM shall ensure, and the Defendant shall facilitate, the posting of copies of any environmental compliance audits, annual reports, and/or any other reports prepared pursuant to the

NECP or ECP-NC on a company web page with public access.

- Subject to the approval of the CAM, the Defendant may redact confidential business information or any information it reasonably believes could impair the security of its operations before such audits or reports are posted for public access.
- The CAM shall inspect such proposed redactions to determine the propriety of the redactions.
- Notwithstanding the foregoing, unredacted copies shall be provided to the Court. The Defendant may seek to have the filings placed under seal to protect any information that the CAM has deemed to warrant redaction.

(2) The CAM will contemporaneously provide copies of the reports (as posted) to the United States Attorneys' Offices for the Eastern, Middle, and Western Districts of North Carolina; the Department of Justice - Environmental Crimes Section; the United States Environmental Protection Agency - Criminal Investigation Division; and the United States Environmental Protection Agency - Legal Counsel Division. If the reports contain redactions, any of these parties may inspect the redactions and challenge the propriety of the redactions. The Court shall be the final arbiter of any challenge.

v. Nationwide ECP: The NECP shall include, among other things:

(1) Organizational Funding: Co-Defendant DEBS shall maintain and fund the operation of all of the company compliance organizations created in the wake of the Dan River release, including: ABSAT, the Coal Combustion Products organization, and the

National Ash Management Advisory Board. Subject to the approval of the CAM, DEBS may transfer operations and responsibilities between internal organizations or adjust funding of such organizations as appropriate, as long as the obligations of this Agreement are being met. To the extent necessary or required, the Defendant shall fund or otherwise pay for its proportionate share of the continued maintenance and operations of these compliance organizations.

- (2) Compliance Officer ("CO"): The Defendant, and its co-defendants DEBS and DEP, each shall identify or establish a position at the Vice President level or higher who will liaise directly with the CAM. The Defendant's designated CO shall have, among other duties, the primary responsibility for ensuring compliance with applicable environmental requirements and requirements of the NECP and ECP-NC.
- The COs shall submit detailed reports discussing the development, implementation, and enforcement of the NECP and ECP-NC at intervals deemed necessary by the CAM. The first report shall also include an explanation of the current corporate structure responsible for the operation and control of the coal ash impoundments and the names of the individuals filling the relevant positions. With the concurrence of the CAM, the COs may elect to submit a joint report detailing the required information for all three co-defendants. Any changes to the corporate coal ash oversight structure shall be immediately forwarded to the CAM and included in the next regular report.
 - Subject to the approval of the CAM, the Defendant may redact confidential business information or any information it reasonably believes could impair the

security of its operations before such reports are posted for public access.

- The CAM shall inspect such proposed redactions to determine the propriety of the redactions.
 - Notwithstanding the foregoing, unredacted copies shall be provided to the Court. The Defendant may seek to have the filings placed under seal to protect any information that the CAM has deemed to warrant redaction.
 - The CAM will contemporaneously provide copies of the reports (as posted) to the United States Attorneys' Offices for the Eastern, Middle, and Western Districts of North Carolina; the Department of Justice - Environmental Crimes Section; the United States Environmental Protection Agency - Criminal Investigation Division; and the United States Environmental Protection Agency - Legal Counsel Division. If the reports contain redactions, any of these parties may inspect the redactions and challenge the propriety of the redactions. The Court shall be the final arbiter of any challenge.
- (3) Environmental Audits: Within the first ninety (90) days of his or her appointment, the CAM shall establish a schedule for conducting environmental audits of each of Duke Energy Corporation's and its affiliates' wholly-owned or operated domestic facilities with Duke Energy Corporation or affiliate-managed or affiliate-controlled coal ash impoundments outside North Carolina on an annual basis.
- Each year the Defendant can request that the CAM accept any full environmental audit prepared by ABSAT or a similar organization in that same calendar year for its facilities subject to the audits under the NECP.

- The CAM can reject any such request by the Defendant if the CAM concludes that the proposed environmental audit is not sufficiently comprehensive or not prepared by a competent organization.
- Copies of the environmental audit reports shall be posted on the Defendant's company webpage accessible to the public.
- Subject to the approval of the CAM, the Defendant may redact confidential business information or any information it reasonably believes could impair the security of its operations before such audits or reports are posted for public access.
- The CAM shall inspect such proposed redactions to determine the propriety of the redactions.
- Notwithstanding the foregoing, unredacted copies shall be provided to the Court and the United States Probation Officer. The Defendant may seek to have the filings placed under seal to protect any information that the CAM has deemed to warrant redaction.
- The CAM will contemporaneously provide copies of the reports (as posted) to the United States Attorneys' Offices for the Eastern, Middle, and Western Districts of North Carolina; the Department of Justice - Environmental Crimes Section; the United States Environmental Protection Agency - Criminal Investigation Division; and the United States Environmental Protection Agency - Legal Counsel Division. If the reports contain redactions, any of these parties may inspect the redactions to determine the propriety of the redactions. The Court shall be the final arbiter of any challenge.

- (4) Toll-Free Hotline/Electronic Mail Inbox: The Defendant, along with co-defendants DEBS and DEP, will establish and maintain a toll-free hotline that will be answered twenty-four (24) hours a day, seven (7) days a week, through which any person may report suspected violations of applicable environmental laws or regulations, or violations of the NECP or ECP-NC. The Defendant may utilize existing toll-free hotlines subject to approval by the CAM. In addition, the Defendant, along with co-defendants DEBS and DEP, shall create an electronic mail inbox accessible from its webpages and accessible through a share link, through which any employee of Duke Energy Corporation, its subsidiaries, or its affiliates, or any other person may report suspected violations of applicable environmental laws or regulations or violations of the NECP or ECP-NC.
- Co-defendant DEBS shall periodically apprise employees and the public of the availability of the toll-free hotline and electronic mail inbox by posting notices on the Internet, Intranet (known within Duke Energy Corporation as the "Portal"), by distributing notice via its electronic mail system, by providing notices in appropriate employee work areas, and by publication in community outlets.
 - All reports to the toll-free hotline or electronic mail inbox of suspected violations of applicable environmental requirements, the NECP, or the ECP-NC shall promptly be provided to the appropriate CO for further action, and the appropriate CO shall maintain a record of the investigation and disposition of each such matter and disclose such matters in reports to the CAM.
- (5) Environmental Training Program: The Defendant, along with co-defendants DEBS and

DEP, shall adopt, implement, and enforce a comprehensive training program to educate all domestic employees of Duke Energy Corporation and its wholly-owned or operated affiliates on the environmental impact of coal ash impoundment operations and to be aware of the procedures and policies that form the basis of the NECP and ECP-NC.

- The goal of this training program is to ensure that every domestic employee of Duke Energy Corporation and its wholly-owned or operated affiliates understands applicable compliance policies and is able to integrate the compliance objectives in the performance of his/her job. The training shall include applicable notice and reporting requirements in the event of a release or discharge. Subject to the approval of the CAM, the Defendant may develop different training programs that are tailored to the employee's specific job description and responsibilities as long as the overall goal of the training requirement is met.
- Additionally, the Defendant and co-defendants DEBS and DEP shall provide training and written materials describing the safe and proper handling of pollutants, hazardous substances, and/or wastes.
- Copies of all written materials and training curricula shall be provided to the CAM.

vi. Statewide ECP: The ECP-NC, in addition to incorporating all of the requirements of the NECP, shall include, among other things, the following conditions:

- (1) Point of Contact ("POC"): With respect to each of its facilities with coal ash impoundments in North Carolina, the Defendant and co-defendant DEBS shall identify or establish a POC for the CAM

within each of the following three business services: (1) ABSAT; (2) Environmental, Health & Safety; and (3) Coal Combustion Products.

(2) Environmental Audits: Within the first ninety (90) days of his/her appointment, the CAM shall establish a schedule for conducting environmental audits of each of the Defendant's facilities with coal ash impoundments in North Carolina on an annual basis.

- Each year the Defendant can request that the CAM accept any full environmental audit prepared by ABSAT or a similar organization in that same calendar year for two of its facilities subject to the audits. The Defendant cannot make the request for the same facilities in consecutive years.
- The CAM can reject any such request by the Defendant if the CAM concludes that the proposed environmental audit is not sufficiently comprehensive or not prepared by a competent organization.
- Copies of the environmental audit reports shall be posted on the Defendant's company webpage accessible to the public.
- Subject to the approval of the CAM, the Defendant may redact confidential business information or any information it reasonably believes could impair the security of its operations before such audits or reports are posted for public access.
- The CAM shall inspect such proposed redactions to determine the propriety of the redactions.
- Notwithstanding the foregoing, unredacted copies shall be provided to the Court and

the United States Probation Officer. The Defendant may seek to have the filings placed under seal to protect any information that the CAM has deemed to warrant redaction.

- The CAM will contemporaneously provide copies of the reports (as posted) to the United States Attorneys' Offices for the Eastern, Middle, and Western Districts of North Carolina; the Department of Justice - Environmental Crimes Section; the United States Environmental Protection Agency - Criminal Investigation Division; and the United States Environmental Protection Agency - Legal Counsel Division. If the reports contain redactions, any of these parties may inspect the redactions to determine the propriety of the redactions. The Court shall be the final arbiter of any challenge.
- v. The Defendant shall ensure that any new, expanded, or reopened coal ash or coal ash wastewater impoundment facilities are lined to ensure no unpermitted discharges of coal ash or coal ash wastewater to any water of the United States. This includes all engineered, channelized, or naturally occurring seeps.
- w. Recordkeeping of Coal Ash Impoundment Volumes: Every six months, the Defendant shall determine the volume of wastewater and coal ash in each of its wet-storage coal ash impoundments in North Carolina. Additional determinations shall be made following the conclusion of activities that significantly change the volumes of materials in the impoundments, including but not limited to temporary rerouting of waste streams other than sluiced coal ash to the ash impoundment, dredging, and dewatering. Written or electronic records of the volumes shall be maintained by the Defendant in a location(s) accessible to facility staff and to any of the Defendant's employees responsible for making environmental or emergency reports.

x. Bromide Remediation Claims and Costs:

- i. Identification: Within the first year of probation, or within ninety (90) days of the installation of a new Flue Gas Desulfurization ("FGD") scrubber system thereafter, the Defendant shall identify:
 - (1) all facilities operated by it in North Carolina that utilize or will utilize FGD scrubbers that will result in an increase in bromide discharge into surface waters; and
 - (2) all local governments that are downstream from such FGD scrubbers and draw water into water treatment facilities.
- ii. Notification: Within the first year of probation, or within ninety (90) days of the installation of a new FGD scrubber system thereafter, the Defendant shall: (1) notify in writing the identified local governments of the increase or potential increase in bromide discharge; and (2) cooperate in studies of whether there has been or will be an impact on these water treatment facilities. The Defendant shall further advise the local government of the claims process established by the CAM, as described below. The Defendant will further note that the local government is not obligated to submit a claim through the process, is not bound by any recommendation of the CAM, and may pursue any civil and/or administrative remedies available to it. Copies of such correspondence shall be provided to the CAM, United States Probation Officer, and each of the prosecuting districts.
- iii. Claims Process: The CAM shall establish a procedure by which local governments that are downstream of the Defendant's facilities with FGD scrubbers and experience increases in trihalomethanes at their water treatment facilities related to increases in bromide released by those facilities may submit evidence of these impacts and claims for restitution stemming from these impacts.

- (1) In these claims, the local governments bear the burden of proving by a preponderance of the evidence to the CAM that trihalomethanes have increased and that the Defendant's facility's discharge of bromide substantially contributed to the increase.
 - (2) The Defendant shall be permitted an opportunity to respond to any evidence or material submitted by local governments in this process.
 - (3) The CAM shall review proposed remediation actions and costs or anticipated costs associated with investigating, responding to, and remediating increased bromides and trihalomethanes for reasonableness in determining the correct amount of restitution. The CAM shall issue a written decision on every claim submitted. If the CAM determines that restitution to a local government in any amount is appropriate, the Defendant shall also reimburse the local government for costs associated with investigating and preparing its submission to the CAM, including reasonable attorneys' fees.
- iv. Appeals Process: Once the written decision is issued, the Defendant or the local government may appeal the decision to the United States District Court. In such an appeal, the decision of the CAM shall be subject to a rebuttable presumption of correctness. If the Defendant unsuccessfully appeals a written decision of the CAM, the Defendant shall bear all of the costs of the appeal, including the costs of the CAM and the reasonable attorneys' fees of the local government, with the Court making the final determination of the reasonableness of such fees. If the Defendant is successful on appeal, the Defendant shall bear the costs of the CAM and the local government shall bear the costs of its attorneys' fees.

- v. Payment of Claims: Once the CAM has issued its written opinion, the Defendant shall pay the approved costs to the claimant within thirty (30) days of the opinion, unless it files an appeal to the United States District Court as provided above. If, after appeal, the Court concurs with the CAM's opinion approving such costs, the Defendant shall pay the approved costs to the claimant and submit proof of payment to the Court within thirty (30) days of the Court's opinion. Nothing in this subparagraph will bar the CAM or the Court from ordering a different payment schedule as appropriate.
- vi. Deadline for Filing Claims: Local governments shall have until sixty (60) days prior to the end of the five-year (5-year) probationary term to submit a claim.
- y. Force Majeure. For purposes of this Agreement, a "force majeure" is defined as any event arising from causes beyond the reasonable control of the Defendant, any entity controlled by the Defendant, or its contractors that delays or prevents performance of any obligation despite the best efforts to fulfill the obligation and includes but is not limited to war, terrorism, civil unrest, labor dispute, act of God, change in law making performance impossible, or act of a governmental or regulatory body delaying performance or making performance impossible, including, without limitation, any appeal or decision remanding, overturning, modifying, or otherwise acting (or failing to act) on a permit or similar permission or action that prevents or delays an action needed for the performance of any work such that it prevents or substantially interferes with the Defendant's ability to perform. Force majeure does not include financial inability to complete the work, increased cost of performance, or changes in business or economic circumstances.
- i. If the Defendant seeks to rely on "force majeure" to excuse performance or timely performance with any term of this Agreement, the Defendant must apply to the CAM with copies of such application provided to the Government and the United States Probation Officer.

- ii. The final determination of "force majeure" shall be made by the Court with the advice and recommendation from the CAM.
- iii. If the Court concludes that the Defendant's failure to fulfill an obligation of this Agreement was not excused by a "force majeure," the Court may impose and the Government will be entitled to seek additional monetary penalties.
- z. Funding of NECP and ECP-NC: A failure to fund or implement the NECP or ECP-NC during its term of probation would constitute a breach of this Agreement by the Defendant, and the Defendant shall be subject to prosecution for any federal criminal violation not barred by the applicable statute of limitations (or as waived pursuant to Paragraph 3(hh)) or other legal prohibition. Any information provided by the Defendant may be used against the Defendant in such a prosecution.
- aa. Community Service Payment: In addition to the community service payment made by co-defendant DEP, the Defendant, as guaranteed by Duke Energy Corporation and set forth in the Guaranty attached to this Agreement, shall pay \$13.5 million (\$13,500,000) to the National Fish and Wildlife Foundation ("NFWF"), a nonprofit organization established pursuant to 16 U.S.C. §§ 3701-3710, as community service by an organization. With respect to the work described in this Paragraph below, the Defendant shall assume no responsibilities or obligations other than making the payments described in Paragraph 3(aa)(i) below. The Defendant shall not seek any reduction in its tax obligations as a result of these community service payments nor shall the Defendant characterize, publicize, or refer to these payments as voluntary donations or contributions. Additionally, the Defendant shall not seek or take credit for any project performed using funds disbursed by NFWF pursuant to this Agreement in any related civil or administrative proceeding, including but not limited to, the Natural Resources Damages Assessment process.

- i. The Defendant will make the \$13.5 million (\$13,500,000) payment within sixty (60) days of entry of Judgment. Payments shall be made by certified check payable to the National Fish and Wildlife Foundation and mailed to the attention of its Chief Financial Officer at 1133 15th Street, NW, Suite 1100, Washington, DC 20005, and include a reference to the case number in this proceeding; or by electronic funds transfer in accordance with written instructions to be provided to the Defendant by NFWF at the time of transfer.
- ii. NFWF shall use the money it receives from the Defendant pursuant to this Agreement for the benefit, preservation, restoration, and improvement of the water resources of North Carolina and Virginia that have been impacted by the operation of coal ash storage ponds owned by the Defendant. NFWF shall conduct or fund projects in the following federal districts, in the following amounts:
 - (1) Eastern District of North Carolina: \$3.5 million (\$3,500,000);
 - (2) Middle District of North Carolina: \$3.5 million (\$3,500,000);
 - (3) Western District of North Carolina: \$3.5 million (\$3,500,000); and
 - (4) Eastern District of Virginia and Western District of Virginia: \$3 million (\$3,000,000).
- iii. The projects and initiatives considered by NFWF should include, but not be limited to: monitoring, study, restoration, and preservation of fish, wildlife, and plant resources; monitoring, study, clean up, remediation, sampling, and analysis of pollution and other threats to the riparian environment and ecosystem; research, study, planning, repair, maintenance, education, and public outreach relating to the riparian environment and ecosystem; environmental education and training

relating to the protection and preservation of riparian resources; and the protection and support of public drinking water systems.

- iv. The projects and initiatives considered by NFWF should be focused on the following river basins or watersheds: Broad River, Cape Fear River, Catawba River, Dan River, French Broad River, Lumber River, Roanoke River, Neuse River, and Yadkin River. NFWF shall make every effort to fund at least one project and/or initiative in each of the river basins or watersheds.
- v. NFWF shall consult with appropriate state resource managers in North Carolina and Virginia, as well as federal resource managers, that have statutory authority for coordination or cooperation with private entities to help identify projects and maximize the environmental benefits of such projects. Specifically, NFWF should consult with the United States Environmental Protection Agency, the United States Fish and Wildlife Service, the United States Army Corps of Engineers, the North Carolina Department of Environment and Natural Resources, the North Carolina Wildlife Resources Commission, the Virginia Department of Environmental Quality, the Virginia Department of Conservation and Recreation, and the Virginia Department of Game and Inland Fisheries. NFWF shall further consult with localities as appropriate. NFWF is not bound by any recommendations from any of the state or federal agencies, resource managers, or localities consulted.
- vi. Projects shall be identified and funding obligated within five (5) years of the date of entry of Judgment in this case.
- vii. In identifying and selecting projects to receive funding pursuant to this Agreement and related Judgment, NFWF shall not incur liability of any nature in connection with any act or omission, made in good faith, in the administration of the funds or otherwise pursuant to this Agreement, excepting, however, liability resulting from

NFWF's gross negligence or willful misconduct. In addition, if and to the extent NFWF grants funds to or contracts with any governmental entity to implement any project under this Agreement and related Judgment: (a) NFWF shall be deemed to act solely as an administrative agent in contracting for, granting to, and disbursing funds for any such project; and (b) NFWF shall not be deemed to incur liability of any nature in connection with the design, engineering, construction, operation, or maintenance of any such project, including, without limitation, any impact or consequences of any such project on fish, wildlife, plant, or other natural resources, personal injury, or property damage.

- viii. NFWF's use of funds received pursuant to this Agreement and related Judgment shall be subject to the reporting requirements of 16 U.S.C. § 3706. In addition, NFWF shall report to the United States Probation Office and to the parties regarding the status and disposition of money it has received pursuant to this Agreement and related Judgment, on at least an annual basis, until all such money has been spent.
- bb. Mitigation: Within ninety (90) days of sentencing, in order to mitigate impacts to wetlands and other jurisdictional waters of the United States impacted as a result of the Defendant's operation of coal ash impoundments and any relevant criminal conduct, including temporal and secondary effects, at its facilities in North Carolina with coal ash impoundments, and in addition to the mitigation payment made by its co-defendant DEP, the Defendant shall provide \$5 million (\$5,000,000), which represents its share after apportionment of a total \$10 million (\$10,000,000) payment, to an authorized wetlands mitigation bank for the purchase of wetland and/or riparian land and/or restoration equivalent located in the Broad River Basin, French Broad River Basin, Cape Fear River Basin, Catawba River Basin, Dan River Basin, Yadkin-Pee Dee River Basin, Neuse River Basin, Lumber River Basin, and Roanoke River Basin. This mitigation payment is in addition to, and does not replace, Duke Energy Corporation's public commitment to fund its \$10 million

(\$10,000,000) Water Resources Fund for environmental and other philanthropic projects along lakes and rivers in the Southeast.

- i. Such wetland restoration shall be made through an authorized wetlands mitigation bank with no affiliation to any current or former employee of the North Carolina Department of Environment and Natural Resources in that employee's individual capacity.
- ii. The Defendant, along with its co-defendants DEBS and DEP, shall provide a list of three (3) proposed mitigation banks from which the Court will select the mitigation bank to receive the funds. If the Defendant is unable after reasonable efforts to identify one or more mitigation banks, the Defendant may substitute one or more conservation trust funds within the State of North Carolina in its proposal as long as all other conditions of this section are being met.
- iii. Such property must be purchased in the State of North Carolina by the selected authorized wetlands mitigation bank or conservation trust within four (4) years from the date of entry of Judgment.
- iv. Such property shall be held by and titled in the name of a third-party (with no affiliation to the Defendant or any of the Defendant's sister or parent corporations).
- v. Such property shall be held in permanent conservation status for the benefit of the citizens of North Carolina.
- vi. The Defendant shall ensure that the selected authorized wetlands mitigation bank or conservation trust provides a full accounting of all mitigation property purchased to the Court and the CAM, and documentary evidence that the property has been placed in permanent conservation status.

- cc. No Credit in Civil or Administrative Proceedings: The Defendant shall not seek or take credit for any fine, restitution, community service payment, mitigation payment, or funding of the environmental compliance plan (including the costs associated with the hiring or payment of staff or consultants needed to assist the CAM) under this Agreement in any related civil or administrative proceeding, including, but not limited to, the Natural Resources Damages Assessment process.
- dd. No Capitalization or Tax Deduction: The Defendant shall agree that: (1) it shall not capitalize into inventory or basis or take as a tax deduction, in the United States or elsewhere, any portion of the monetary payments (fine, restitution, community service, mitigation, or funding of the environmental compliance plans) made pursuant to this Agreement. Provided, however, that nothing in this Agreement shall bar or prevent the Defendant from appropriately capitalizing or seeking an appropriate tax deduction for restitution in connection with the remediation of bromide claims set forth in this Agreement or for costs which would have been incurred by the Defendant irrespective of the environmental compliance plans. Costs that would have been incurred irrespective of the environmental compliance plans include, by way of example only, costs for staffing and operating Central Engineering Services, ABSAT, Coal Combustion Products, or other similar organizations.
- ee. No Rate Increase Based Upon Monetary Penalties: The Defendant shall not reference the burden of, or the cost associated with, compliance with the criminal fines, the restitution related to counts of conviction, the community service payments, the mitigation obligation, the costs of the clean-up in response to the February 2, 2014, release at Dan River Steam Station, and/or the funding of the environmental compliance plans in any request or application for a rate increase on customers. Provided, however, that nothing in this Agreement shall bar or prevent the Defendant from seeking appropriate recovery for restitution in connection with the remediation of bromide claims set forth in this Agreement or for costs which would have been incurred by the Defendant irrespective of the

environmental compliance plans. Costs that would have been incurred irrespective of the environmental compliance plans include, by way of example only, costs for staffing and operating Central Engineering Services, ABSAT, Coal Combustion Products, or other similar organizations.

- ff. Public Apology: Consistent with USSG §8D1.4(a), and in conjunction with its co-defendants DEBS and DEP, the Defendant shall place a full-page advertisement in at least two national newspapers and three major North Carolina newspapers (one in Raleigh, one in Greensboro, and one in Charlotte) and on its publicly accessible company website. The full page advertisement shall run within five (5) days of entry of the plea. The language of the public apology must be agreed upon by each of the federal districts and is appended to this Agreement as Exhibit C.
- gg. The Defendant shall not reference this Agreement, any payments pursuant hereto, or other compliance herewith in any public relations, marketing, or advertising. The Defendant shall be permitted to make required disclosures under applicable securities laws.
- hh. Tolling of Statute of Limitations: To ensure compliance with the terms of the Agreement, the Defendant waives any statute of limitations as of the date of this Agreement through the full term of Defendant's probation and until all of the Defendant's obligations under this Agreement have been satisfied with regard to any conduct relating to or arising out of the conduct set forth in the Criminal Informations.
- ii. The Defendant waives any claim under the Hyde Amendment, 18 U.S.C. § 3006A (Statutory Note), for attorneys' fees and other litigation expenses arising out of the investigation or prosecution of this matter.
- jj. The Defendant agrees to withdraw from and not to participate in any joint defense agreement, informal or formal, in connection with the defense by any person designated as a "target" or "subject" of, or indicted for, any potential criminal charges relating

to the Clean Water Act violations in North Carolina that are the subject of this Agreement and any allegations of violations of Title 18 of which the Defendant is aware or becomes aware. The Defendant agrees to submit a written statement, signed by counsel and the appropriate corporate officer, reflecting this commitment to the United States prior to entry of this Agreement.

- kk. Term of Supervised Probation: The Defendant and the Government agree that the Defendant shall be placed on organizational supervised probation for a period of five (5) years from the date of sentencing pursuant to 18 U.S.C. § 3561(c)(2) and USSG §§8D1.1 and 8D1.2.

4. The Defendant represents and/or acknowledges:

- a. That the Defendant has had the assistance of an attorney in connection with the charges against it. That the attorney has carefully reviewed this Agreement with those persons designated by law and its bylaws to act on behalf of the Defendant (hereinafter referred to as "Designated Corporate Representative") and that this Agreement has been signed by a person authorized by law and the bylaws of the Defendant to execute agreements on behalf of the Defendant.
- b. That its Designated Corporate Representative has reviewed and discussed the Criminal Informations filed in each of the federal districts involved in this matter with the Defendant's attorney and that the attorney has explained the Government's evidence to that Designated Corporate Representative.
- c. That as a corporation, it is vicariously liable for the criminal acts of its employees acting within the scope of their employment for the benefit of the corporation.
- d. That it understands that this Agreement does not provide or promise any waiver of any civil or administrative actions, sanctions, or penalties that may apply, including but not limited to fines; penalties; claims for damages to natural resources; suspension, debarment, listing to restrict rights and

opportunities of the Defendant to contract with or receive assistance, loans, and benefits from United States agencies; licensing; injunctive relief; or remedial action to comply with any applicable regulatory requirement. The Defendant understands that this Agreement has no effect on any proceedings against any party not expressly mentioned herein, including the actual or potential criminal liability of any individuals.

- e. Guaranty: That it has sought and obtained a guarantee of its obligations under this Agreement from its parent holding company, Duke Energy Corporation, a copy of which is attached hereto as Exhibit B and incorporated herein by reference. Duke Energy Corporation further consents to the jurisdiction of the United States District Court for the Eastern District of North Carolina for the purpose of enforcing the Guaranty Agreement.
- f. Resolution: That it has filed with the Court prior to entry of this Agreement the original resolution from the board of directors (or equivalent written authorization as recognized by law) that gives the authority described in Paragraph 4(a) above to the Designated Corporate Representative and that authorizes such employee to execute this Agreement on behalf of the Defendant. A copy of the Resolution, attached hereto as Exhibit D, provides as follows:
 - i. The Defendant is a legally viable entity, authorized to plead guilty to the charges set forth in the Criminal Informations;
 - ii. The Defendant shall be bound by the specific terms of this Agreement;
 - iii. The parent corporation, Duke Energy Corporation, is authorized to guarantee all payments (criminal fine, restitution, community service, and mitigation), and funding and performance due from the Defendant in connection with its obligations under the NECP and ECP-NC under this Agreement, as set forth in the Guaranty Agreement.
 - iv. Any legal successor or assignee of Duke Energy Corporation shall remain liable, as the case may

be, for the guarantee of the Defendant's payment obligations and the funding and performance of both the NECP and ECP-NC hereunder, and an agreement to so remain liable shall be included by Duke Energy Corporation in the terms of any sale, acquisition, or merger.

- v. Any legal successor or assignee of the Defendant shall remain liable for the Defendant's obligations in this Agreement, and an agreement to so remain liable shall be included by the Defendant in the terms of any sale, acquisition, or merger of the Defendant with or by any other entity. Subject to the requirements of this subparagraph, nothing shall prevent the Defendant from undergoing a corporate reorganization or change in form. The Defendant shall record a copy of the Judgment with the Register of Deeds in each of the counties in North Carolina in which it owns and operates facilities with coal ash impoundments. Upon written request from the Defendant made only after fulfillment of all of the conditions of this Agreement and related Judgment, the Government shall take the necessary steps through the Register of Deeds to facilitate the removal of the notice of the Judgment.

5. The Defendant understands, agrees, and admits:

- a. That as to each Count of the Criminal Informations to which the Defendant is pleading guilty, the charge, code section, elements, and applicable penalties are as follows:

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United States v. Duke Energy Business Services LLC,
Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc.,
No. 5:15-CR-67-H-2¹

Violations at Dan River Steam Station

COUNT ONE

- (1) Clean Water Act violation for the unpermitted discharge through the 48-inch stormwater pipe at the Dan River Steam Station and aiding and abetting
- (2) Code Sections
violated: 33 U.S.C. §§ 1311, 1319(c) (1) (A),
and 1342; and
18 U.S.C. § 2
- (3) Offense date: No later than February 2, 2014,
through February 8, 2014
- (4) Elements of the Offense:

First: The Defendant did discharge a pollutant,
to wit, coal ash and coal ash
wastewater;

Second: from a point source;

Third: into a water of the United States;

Four: the Defendant did so without a permit;

Five: the Defendant acted negligently in so
doing; and

Six: the Defendant aided and abetted another
in so doing.
- (5) Maximum term of probation for a corporation:
5 years pursuant to 18 U.S.C. § 3561(c) (2) and
USSG §8D1.2(a) (2)

¹Counts Five and Six are captured by the Plea Agreement in United States v. Duke Energy Progress, Inc., No. 5:15-CR-62-H-2; No. 5:15-CR-67-H-3; and No. 5:15-CR-68-H-3.

- (6) Minimum term of probation for a corporation:
0 years pursuant to 18 U.S.C. § 3561(c)(2) and
USSG §8D1.2(a)(2)
- (7) Maximum fine: Pursuant to 18 U.S.C. § 3571(c)
and (d), the greater of: not less than \$2,500 nor
more than \$25,000 per day of violation (33 U.S.C.
§ 1319(c)(1)(A)); \$200,000.00; or twice the gross
gain or loss.
- (8) Restitution pursuant to 18 U.S.C. §§ 3663, 3663A,
and 3563(b)(2) as agreed to in Paragraphs 2(iv)-
(v) and 3(b)-(c) above.
- (9) Special assessment: \$ 125.00
- (10) Other penalties: Public Notice of Violation;
Development of a Compliance Program; Community
Service; and Remediation

COUNT TWO

- (1) Clean Water Act violation for the failure to
maintain the 48-inch stormwater pipe at the Dan
River Steam Station and aiding and abetting
- (2) Code Sections
violated: 33 U.S.C. §§ 1319(c)(1)(A),
and 1342; and
18 U.S.C. § 2
- (3) Offense date: No later than January 2012,
through February 2, 2014
- (4) Elements of the Offense:

First: The Defendant did violate a condition of
its NDPES permit issued by the State of
North Carolina pursuant to the Clean
Water Act; to wit, the requirement to
properly maintain its equipment as more
fully described in the Criminal
Information;

Second: the Defendant acted negligently in so
doing; and

Third: the Defendant aided and abetted another
in so doing.

- (5) Maximum term of probation for a corporation:
5 years pursuant to 18 U.S.C. § 3561(c)(2) and
USSG §8D1.2(a)(2)
- (6) Minimum term of probation for a corporation:
0 years pursuant to 18 U.S.C. § 3561(c)(2) and
USSG §8D1.2(a)(2)
- (7) Maximum fine: Pursuant to 18 U.S.C. § 3571(c)
and (d), the greater of not less than \$2,500 nor
more than \$25,000 per day of violation (33 U.S.C.
§ 1319(c)(1)(A)); \$ 200,000.00; or twice the
gross gain or loss.
- (8) Restitution pursuant to 18 U.S.C. §§ 3663, 3663A,
and 3563(b)(2) as agreed to in Paragraphs 2(iv) -
(v) and 3(b)-(c) above.
- (9) Special assessment: \$ 125.00
- (10) Other penalties: Public Notice of Violation;
Development of a Compliance Program; Community
Service; and Remediation

COUNT THREE

- (1) Clean Water Act violation for the unpermitted
discharge through the 36-inch stormwater pipe at
the Dan River Steam Station and aiding and
abetting
- (2) Code Sections
violated: 33 U.S.C. §§ 1311, 1319(c)(1)(A)
and 1342; and
18 U.S.C. § 2
- (3) Offense date: No later than January 2012
through February 21, 2014

(4) Elements of the Offense:

- First: The Defendant did discharge a pollutant, to wit, coal ash and coal ash wastewater;
- Second: from a point source;
- Third: into a water of the United States;
- Four: the Defendant did so without a permit;
- Five: the Defendant acted negligently in so doing; and
- Six: the Defendant aided and abetted another in so doing.

- (5) Maximum term of probation for a corporation:
5 years pursuant to 18 U.S.C. § 3561(c)(2) and USSG §8D1.2(a)(2)
- (6) Minimum term of probation for a corporation:
0 years pursuant to 18 U.S.C. § 3561(c)(2) and USSG §8D1.2(a)(2)
- (7) Maximum fine: Pursuant to 18 U.S.C. § 3571(c) and (d), the greater of: not less than \$2,500 nor more than \$25,000 per day of violation (33 U.S.C. § 1319(c)(1)(A)); \$200,000.00; or twice the gross gain or loss.
- (8) Restitution pursuant to 18 U.S.C. §§ 3663, 3663A, and 3563(b)(2) as agreed to in Paragraphs 2(iv) - (v) and 3(b)-(c) above.
- (9) Special assessment: \$ 125.00
- (10) Other penalties: Public Notice of Violation; Development of a Compliance Program; Community Service; and Remediation

COUNT FOUR

- (1) Clean Water Act violation for the failure to maintain the 36-inch stormwater pipe at the Dan River Steam Station and aiding and abetting
- (2) Code Sections violated: 33 U.S.C. §§ 1319(c)(1)(A), and 1342; and 18 U.S.C. § 2
- (3) Offense date: No later than January 2012, through February 6, 2014
- (4) Elements of the Offense:
 - First: The Defendant did violate a condition of its NDPES permit issued by the State of North Carolina pursuant to the Clean Water Act; to wit, the requirement to properly maintain its equipment as more fully described in the Criminal Information;
 - Second: the Defendant acted negligently in so doing; and
 - Third: the Defendant aided and abetted another in so doing.
- (5) Maximum term of probation for a corporation: 5 years pursuant to 18 U.S.C. § 3561(c)(2) and USSG §8D1.2(a)(2)
- (6) Minimum term of probation for a corporation: 0 years pursuant to 18 U.S.C. § 3561(c)(2) and USSG §8D1.2(a)(2)
- (7) Maximum fine: Pursuant to 18 U.S.C. § 3571(c) and (d), the greater of: not less than \$2,500 nor more than \$25,000 per day of violation (33 U.S.C. § 1319(c)(1)(A)); \$200,000.00; or twice the gross gain or loss.
- (8) Restitution pursuant to 18 U.S.C. §§ 3663, 3663A, and 3563(b)(2) as agreed to in Paragraphs 2(iv) - (v) and 3(b)-(c) above.

- (9) Special assessment: \$ 125.00
- (10) Other penalties: Public Notice of Violation;
Development of a Compliance Program; Community
Service; and Remediation

United States v. Duke Energy Business Services LLC,
Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc.,
No. 5:15-CR-68-H-2²

VIOLATIONS AT RIVERBEND STEAM STATION

COUNT ONE

- (1) Clean Water Act violation for the unpermitted discharge from a toe drain at the ash impoundment at Riverbend Steam Station and aiding and abetting
- (2) Code Sections violated: 33 U.S.C. §§ 1311, 1319(c)(1)(A), and 1342; and
18 U.S.C. § 2
- (3) Offense date: No later than November 8, 2012, through December 30, 2014
- (4) Elements of the Offense:
 - First: The Defendant did discharge a pollutant, to wit, coal ash and coal ash wastewater;
 - Second: from a point source;
 - Third: into a water of the United States;
 - Four: the Defendant did so in violation of a permit;

² Count Two is captured by the Plea Agreement in United States v. Duke Energy Progress, Inc., No. 5:15-CR-62-H-2; No. 5:15-CR-67-H-3; and No. 5:15-CR-68-H-3.

Five: the Defendant acted negligently in so doing; and

Six: the Defendant aided and abetted another in so doing.

- (5) Maximum term of probation for a corporation:
5 years pursuant to 18 U.S.C. § 3561(c)(2) and USSG §8D1.2(a)(2)
- (6) Minimum term of probation for a corporation:
0 years pursuant to 18 U.S.C. § 3561(c)(2) and USSG §8D1.2(a)(2)
- (7) Maximum fine: Pursuant to 18 U.S.C. § 3571(c) and (d), the greater of: not less than \$2,500 nor more than \$25,000 per day of violation (33 U.S.C. § 1319(c)(1)(A)); \$200,000.00; or twice the gross gain or loss.
- (8) Restitution pursuant to 18 U.S.C. §§ 3663, 3663A, and 3563(b)(2) as agreed to in Paragraphs 2(iv) - (v) and 3(b)-(c) above.
- (9) Special assessment: \$ 125.00
- (10) Other penalties: Public Notice of Violation; Development of a Compliance Program; Community Service; and Remediation

Total Statutory Penalties: 5 years of probation; a minimum fine of \$45,740,000; a maximum fine of \$115,375,000; and \$625.00 special assessment.

6. The United States agrees:

- a. That pursuant to Fed. R. Crim. P. 11(c)(1)(C), the sentence set forth in Paragraph 2 above is warranted.
- b. That it reserves the right at sentencing to present any evidence and information pursuant to 18 U.S.C. § 3661, to offer argument or rebuttal, to recommend imposition of restitution, and to respond to any motions or objections filed by the Defendant.
- c. That, subject to the reservations within this Agreement, the United States shall not further

prosecute the Defendant, including all predecessors, successors, and assignees of the Defendant, for conduct constituting the basis for the Criminal Informations covered by this Agreement as set forth in the Joint Factual Statement or about which the United States Attorneys' Offices for the Eastern, Middle, and Western Districts and the Department of Justice - Environmental Crimes Section were otherwise aware of as of the date of this Agreement. This Agreement shall not apply to individuals. Should the Court determine that the Defendant has breached this Agreement, the Defendant will not be entitled to withdraw its plea of guilty, and the United States may prosecute the Defendant, and any predecessors, successors, and assignees of the Defendant for conduct constituting the basis for the Criminal Informations covered by this Agreement, notwithstanding the expiration of any applicable statutes of limitations following the signing of this Agreement. In any such prosecution, the United States may use the Defendant's admissions of guilt as admissible evidence against the Defendant.

- d. That it will make known to the Court at sentencing the full extent of the Defendant's cooperation.
- e. Pursuant to USSG §1B1.8, that self-incriminating information provided by the Defendant pursuant to this Agreement shall not be used against the Defendant in determining the applicable advisory Guideline range, except as provided by USSG §1B1.8 and except as stated in this Agreement. The United States may provide to the United States Probation Office any evidence concerning relevant conduct.
- f. Notwithstanding the foregoing, the United States Attorneys' Offices for the Eastern, Middle, and Western Districts of North Carolina and the Department of Justice - Environmental Crimes Section further recognize that this Agreement does not provide or promise any waiver of any civil or administrative actions, sanctions, or penalties that may apply, including but not limited to: fines; penalties; claims for damages to natural resources; suspension, debarment, listing to restrict rights and opportunities of the Defendant to contract with or receive assistance, loans, and benefits from United

States agencies; licensing; injunctive relief; or
remedial action to comply with any applicable
regulatory requirement.

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SO AGREED, THIS 20th DAY OF FEBRUARY, 2015.

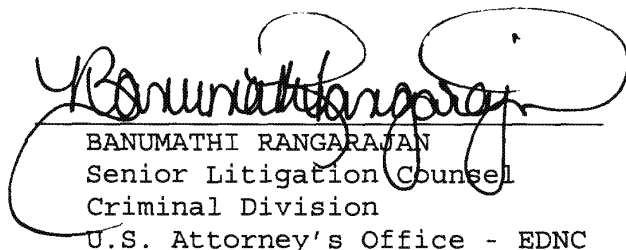
THOMAS G. WALKER
U.S. Attorney
Eastern District of North Carolina
North Carolina

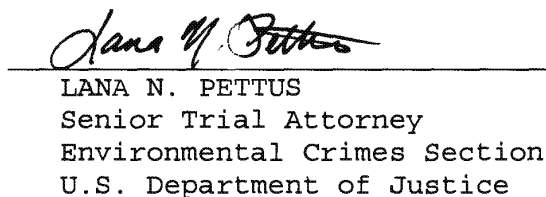
JOHN C. CRUDEN
Assistant Attorney General
Department of Justice
Environment and Natural
Resources Division

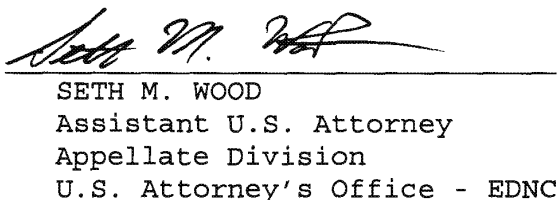
JILL WESTMORELAND ROSE
Attorney for the United States
Acting Under Authority
Conferred by 28 USC §515
Western District of North Carolina

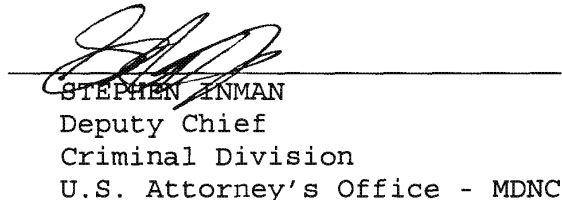
CLIFTON T. BARRETT
Attorney for the United States
Acting Under Authority
Conferred by 28 USC §515
Middle District of North Carolina

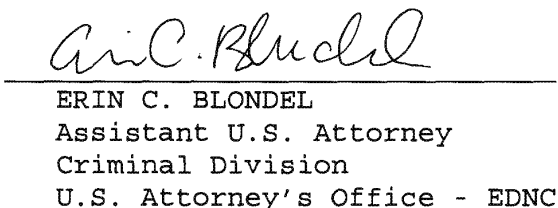
ON BEHALF OF EACH PROSECUTING OFFICE:

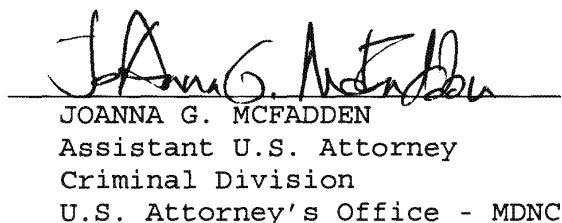

BANUMATHI RANGARAJAN
Senior Litigation Counsel
Criminal Division
U.S. Attorney's Office - EDNC

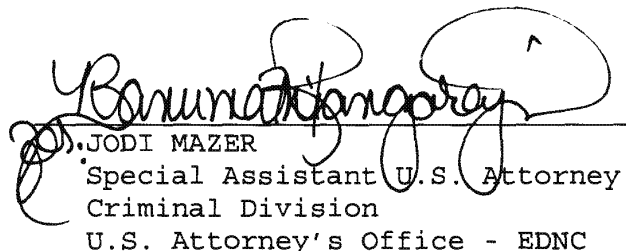

LANA N. PETTUS
Senior Trial Attorney
Environmental Crimes Section
U.S. Department of Justice

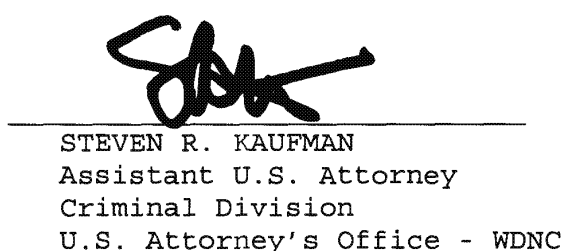

SETH M. WOOD
Assistant U.S. Attorney
Appellate Division
U.S. Attorney's Office - EDNC


STEPHEN INMAN
Deputy Chief
Criminal Division
U.S. Attorney's Office - MDNC


ERIN C. BLONDEL
Assistant U.S. Attorney
Criminal Division
U.S. Attorney's Office - EDNC

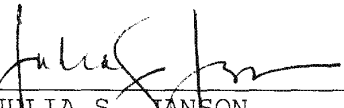

JOANNA G. MCFADDEN
Assistant U.S. Attorney
Criminal Division
U.S. Attorney's Office - MDNC


JODI MAZER
Special Assistant U.S. Attorney
Criminal Division
U.S. Attorney's Office - EDNC



STEVEN R. KAUFMAN
Assistant U.S. Attorney
Criminal Division
U.S. Attorney's Office - WDNC

SO AGREED, THIS 20 DAY OF FEBRUARY, 2015.

DUKE ENERGY CAROLINAS, LLC
Defendant

BY: 

JULIA S. JANSON
Executive Vice-President,
Chief Legal Officer, and Corporate
Secretary
DUKE ENERGY CAROLINAS, LLC and
Authorized Designated Official for
DUKE ENERGY CAROLINAS, LLC

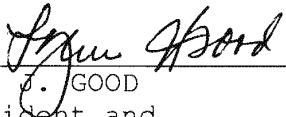


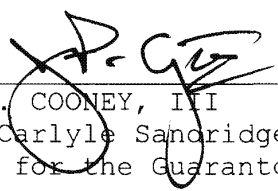
JAMES P. COONEY, III
Womble Carlyle Sandridge & Rice LLP
Counsel for the Defendant

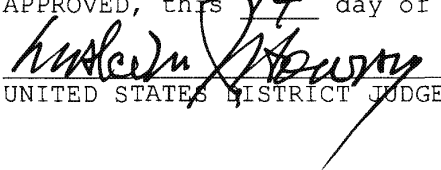
The undersigned, Lynn J. Good, President and Chief Executive Officer of Duke Energy Corporation, the Guarantor, hereby acknowledges the terms and conditions of the foregoing Plea Agreement as they apply to the Guaranty set forth in Exhibit B.

SO ACKNOWLEDGED, THIS 20 DAY OF FEBRUARY, 2015.

DUKE ENERGY CORPORATION
Guarantor

BY: 
LYNN J. GOOD
President and
Chief Executive Officer
DUKE ENERGY CORPORATION


JAMES P. COONEY, III
Womble Carlyle Sandridge & Rice, LLP
Counsel for the Guarantor

APPROVED, this 14th day of May, 2015.

UNITED STATES DISTRICT JUDGE